Prepared for:

TRANSCO INC.
200 North LaSalle Street, Suite 1550
Chicago, IL 60601

VOLUNTARY REMEDIATION PROGRAM COMPLIANCE STATUS REPORT
Former Transco Railcar Facility
Macon, Georgia

Prepared by:

EPS

a Montrose Environmental Group company

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Sandy Springs, GA 30350
Tel: 404-315-9113

March 2019

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Kirk Kessler, PG
Senior Principal

March 2019

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

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VOLUNTARY REMEDIATION PROGRAM
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TRANSCO INC.
200 North LaSalle Street, Suite 1550
Chicago, Il 60601

GROUNDWATER SCIENTIST STATEMENT

I certify that I am a qualified groundwater scientist who has received a baccalaureate or post-graduate degree in the natural sciences or engineering and have sufficient training and experience in groundwater hydrology and related fields, as demonstrated by state registration and completion of accredited university courses, that enable me to make sound professional judgments regarding groundwater monitoring and contaminant fate and transport. I further certify that this Voluntary Remediation Program Compliance Status Report for Transco Inc. was prepared by me and appropriate qualified subordinates working under my direction.

Certified by: _____ Date: 3/25/2019

Kirk Kessler, P.G.
Senior Principal
No. 685

a Montrose Environmental Group company

VOLUNTARY REMEDIATION PROGRAM
COMPLIANCE STATUS REPORT

TRANSCO INC.
200 North LaSalle Street, Suite 1550
Chicago, Il 60601

CERTIFICATION OF COMPLIANCE

I certify that this CSR report and all attachments were prepared under my direction in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Based on my review of the findings of this report with respect to the Risk Reduction Standards (RRSs) under the Rules for Hazardous Site Response, Rule 391-3-19-.07 and the Voluntary Remediation Program Act, O.C.G.A 12-8-108, I have determined that Bibb County Tax Parcel R0810091OC 79 is in compliance with Non-Residential RRSs for soil. Furthermore, this parcel is in compliance with Type 4 RRSs, which include property and groundwater use restrictions under an environmental covenant.

Certified by: Charles P Andersen Date: March 25, 2019
Transco Inc.
Charles P. Andersen, CEO

1 INTRODUCTION

1.1 Document Overview

This Voluntary Remediation Program (VRP) Compliance Status Report (CSR) is being submitted to the Georgia Department of Natural Resources, Environmental Protection Division (EPD) on behalf of Transco Inc. (Transco) for the former Transco Railcar Facility (the "Site") located at 861 7th Street, Macon, Georgia and listed under the Hazardous Site Response Act (HSRA) Hazardous Site Inventory (HSI) #10502. The parcel tax map, warranty deed, and legal description for the Site are included in Appendix A.

The Site was accepted into the VRP on August 22, 2018. This CSR serves as a progress report for the current reporting period (August 2018 through February 2019) and demonstrates that the Site is in compliance with the requirements of the VRP.

This CSR will demonstrate compliance by presenting the Site-specific assessment results and actions outlined below.

- Following the 2011 removal action, the soil is in compliance with the Site-specific non-residential Risk Reduction Standard (RRS), and as detailed in this report soil assessment activities have resulted in the horizontal delineation of soil-bound lead.
- Groundwater has been horizontally and vertically delineated, and it has been established through modeling that the groundwater plume will not affect the hypothetical point of exposure (POE). Based on the conclusion of a recently conducted water well survey review that no drinking water wells exist within specified distances downgradient of the Site, Transco is not required to certify compliance for groundwater under the VRP.
- The updated light nonaqueous phase liquid (LNAPL) conceptual site model (LCSM) and LNAPL transmissivity analysis presented in this report finds that (1) the LNAPL condition does not pose a risk to off-Site receptors, (2) the LNAPL condition is stable and understood, and potential on-Site risk can be managed through land use controls, and (3) LNAPL has been recovered to the extent practicable under the remedial action technologies enacted to date.
- Site groundwater and property use limitations (*i.e.*, non-residential occupation only) will be established with a Uniform Environmental Covenant (UEC) to manage future on-Site potential risk.

1.2 Background

The Site is located in an industrial area (zoned industrial) southeast of downtown Macon, Georgia (Figure 1.1). Land use immediately adjacent to the Site is industrial and is primarily railroad related, with several surrounding land parcels designated a public utility due to their

use to support public works or railway infrastructure (Figure 1.2). Adjacent land parcel ownership and Parcel ID are provided in Figure 1.2. The Site is bound by railroad tracks on the western, southern and northeastern property boundaries, and by 7th Street to the east. The Norfolk Southern Railway Brosnan Rail Yard encompasses the area east of 7th Street.

Since at least 1889, the Site was developed to support the railroad industry and was occupied until 1991 when operations by Transco ceased. The Site is currently vacant, and the only remaining structure is a former multi-story coal chute near the Site's south entrance. Concrete and brick foundations of several of the former buildings remain on the Site but are leveled to grade. The remainder of the Site has undergone natural succession to scrub grass, shrubs and small to medium-sized trees. The Site is fenced with a locked gate. Figure 1.3 depicts the location of former and existing Site infrastructure.

Environmental assessment activities for the Site began on or around 1995 following the closure of the facility in 1991. Regulated substances released to soil or groundwater provided in the HSI listing summary include the following: soil (lead, PCBs); groundwater (chlorobenzene, cumene, naphthalene, tetrachloroethene (PCE), vinyl chloride, cis-1,2-dichloroethene (cis-DCE), trichloroethene (TCE)). A CSR prepared in 2000 summarized the status of soil and groundwater constituents of potential concern (COPC) with a conclusion that applicable RRS under HSRA were exceeded and thus corrective action was required for the Site (Arcadis, 2000). A Corrective Action Plan (CAP) for the Site to address identified environmental conditions was prepared in 2001 (Arcadis, 2001), and revised in 2003 including Site-specific RRS (Arcadis, 2003). The 2003 CAP was conditionally approved on September 2, 2004, with final approval of a revised CAP and Site-specific RRS on December 4, 2008 (EPD, 2004; EPD, 2008).

To date, corrective action has been performed for each environmental condition as outlined in the revised CAP including soil remediation, LNAPL assessment and recovery, and monitoring for lead and volatile organic compounds (VOCs) in groundwater.

1.3 Purpose

The purpose of this document is to describe the assessment and remedial activities that have occurred at the Site, to present a finalized CSM and to request Site closure under the VRP.

2 VRP PROJECT MANAGEMENT

2.1 Professional Geologist Oversight

This CSR includes a certification by Kirk Kessler, P.G., Professional Geologist and Senior Principal who has been involved in the project since the implementation of the CAP in 2008. Appendix B contains a monthly summary of hours invoiced by Mr. Kessler, the Professional Geologist specified in the application.

2.2 Milestone Schedule

An updated milestone schedule is included in Appendix C. Each of the tasks specified in the schedule have been completed.

2.3 Conceptual Site Model Status

The final CSM is included in Section 5 of this CSR.

2.4 Environmental Covenant Status

A draft UEC for the Site land parcel is included in Appendix D for review of EPD.

3 SITE ASSESSMENT AND REMEDIATION PERFORMANCE REVIEW

3.1 Site Assessment Review

3.1.1 Groundwater

3.1.1.1 Investigation Summary

Prior to acceptance of the Site into the VRP, the groundwater monitoring well network was comprised of 19 monitoring wells and 10 temporary wells. These wells are separate from the additional 19 temporary wells installed to assess the LNAPL condition discussed in Section 3.1.3. The first monitoring wells, MW-01 through MW-04, were installed in August 1997 and tested for VOCs, polycyclic aromatic hydrocarbons (PAHs) and metals. In April 1999 MW-01 through MW-04 were further assessed for these same constituent groups and for polychlorinated biphenyls (PCBs). The Site well network was expanded in three subsequent events between February 2000 and February 2011 to initially delineate reported detections of PAHs, VOCs, and a single metal (chromium) with later delineation actions limited to VOCs only. Well construction details are provided in Table 3.1, and well locations are depicted in Figure 3.1. A timeline of the monitoring well installation events is provided below.

Groundwater Monitoring Location Summary

August 1997	MW-01 through MW-04 installed during the initial Site investigation to assess for COPC
February-October 2000	MW-11 through MW-15 and TW-01 through TW-10 installed to horizontally delineate COPC. MW-07D, -8D, -9D; installed to vertically delineate COPC
February 2003	MW-16 and MW-17 installed to delineate the off-Site VOC plume
July 2009	MW-18 and MW-19 installed to vertically delineate the off-Site VOC plume
February 2011	MW-20 and MW-21 installed to horizontally delineate the off-Site VOC plume

3.1.1.2 Assessment Findings

This review of the groundwater assessment findings is based on Site information obtained through a review of historical reports (*i.e.*, CSR and CAP) and serves to summarize past and current findings by the constituent group. Discussion of groundwater evaluates delineation to the Site-specific Type I RRS and remedial action with respect to the Type 4 RRS as provided in the approved CAP (Arcadis, 2003).

PCBs

On April 13, 1999, assessment for PCBs in groundwater was performed with a sampling of MW-01 through MW-04. All four monitoring wells reported a non-detect condition for PCBs (detection limit of 1 microgram per liter [µg/L]). No further assessment for dissolved PCBs was warranted.

Metals

Assessment for RCRA metals was first performed in August 1997 for MW-01 through MW-04. Four metals - barium, chromium, lead and silver - were detected during this initial sampling event with follow-up testing performed in 1999 and 2000. The follow-up testing found only the initial detection of chromium in MW-01 to be reproducible with chromium ranging from 1.7 µg/L to 80 µg/L. Trace detection of barium was intermittently reported in all wells ranging from 20 µg/L to 100 µg/L, substantially less than the HSRA Notification Criteria (NC) of 2,000 µg/L. Therefore, no further groundwater assessment for barium, lead, and silver was performed. It is noted that bailer sampling was performed in the early stages of the Site assessment work and groundwater sampling was later modified to low-flow sampling methodology, with low-flow sampling methodology potentially reducing sample turbidity and hence reducing the range of metals detected.

In 2000, seven temporary wells (TW-01 and TW-03 through TW-08), one monitoring well (MW-11) and one deep well (MW-7D) were installed to investigate the chromium detection at MW-01. Sampling and testing of these wells in March through September 2000 found only a single detection of chromium in TW-04 in May 2000, which upon retesting in September 2000 was non-detect for chromium. No further assessment was warranted as delineation for chromium to a non-detect condition was complete and all detections of chromium at MW-01 were below the Site-specific Type 1 RRS (100 µg/L).

PAHs

Sampling and testing for dissolved PAHs, like metals, was first performed in August 1997 for MW-01 through MW-04. One monitoring well, MW-02, reported two PAHs – naphthalene[1] and phenanthrene – during this initial sampling event. Further investigation for the potential presence of PAHs in groundwater was performed in 1999 and 2000 with resampling of MW-01 through MW-04 and installation of additional wells to investigate the groundwater near MW-02. Horizontal delineation efforts for PAHs near MW-02 included six temporary wells (TW-01 through TW-04, TW-09 and TW-10). Vertical delineation near MW-02 comprised of one well, MW-09D. PAHs were not detected at these additional wells during testing performed in March 2000 through June 2000. Testing of MW-02 in April 1999 and October 2000 did not replicate the detection of naphthalene and PAH detections in October 2000 were limited to acenaphthene (5 µg/L), fluorene (7 µg/L) and phenanthrene (5 µg/L), with acenaphthene and fluorene below their Site-specific Type I RRS and phenanthrene equal to it Site-specific Type I RRS. As the four PAHs

[1] Naphthalene has historically been classified as both a VOC and PAH. For the purpose of this report, naphthalene is categorized and discussed as a PAH.

reported in MW-02 were found to be either non-detect in 2000 (*i.e.*, naphthalene), below or equal to their respective Type 1 RRS, and the condition was delineated horizontally and vertically to a non-detect condition, no further assessment was required.

VOCs

Sampling and testing for dissolved VOCs was first performed in August 1997 for MW-01 through MW-04. One of the four wells - MW-04 - reported the detection of TCE at 3 µg/L. Delineation activity to investigate the detection of TCE at MW-04 started in 2000 and comprised of deep well MW-08D for vertical delineation (installed adjacent to MW-04) and four shallow wells for horizontal delineation, MW-12 through MW-15 (MW-15 is located off-Site in the Brosnan Rail Yard, Figure 3.1). Site-wide sampling in 2000 determined that three VOCs – vinyl chloride, carbon tetrachloride and naphthalene (naphthalene was reported as a VOC at this time) – exceeded their respective Site-specific Type 4 RRS and were accordingly identified as constituents of concern (COC) requiring corrective action.

Two modifications to the groundwater COC list were made following the 2000 CSR. First, prior to submission of the CAP in 2003, the toxicity values for TCE were amended resulting in downward adjustment of the TCE Type 4 RRS. As a result, TCE was listed as a fourth VOC to exceed its respective Type 4 RRS and also marked for corrective action. Second, carbon tetrachloride was later removed as a COC in the 2003 CAP following two rounds of testing with a non-detect result. However, data collected since approval of the CAP finds that carbon tetrachloride continues to be intermittently detected in MW-14 above the Site-specific non-residential Type 4 RRS (5 µg/L). It is noted that carbon tetrachloride is co-located with the Site VOC plume and has therefore been included by default in the Site's monitored natural attenuation (MNA) program.

Off-Site delineation of the VOC plume was performed from 2003 to 2011. In February 2003, two monitoring wells were installed to investigate the extent of the off-Site VOC condition near MW-15. Well MW-16 was placed east of MW-15 and MW-17 was placed south of MW-15 (Figure 3.1). Each well was sampled and tested on February 1, 2003, with a finding of no VOCs detected. In accordance with the approved CAP, further off-Site assessment was initiated in 2011 with the installation of well pair MW-18 (deep) and MW-19 (shallow) southeast of MW-15 (Figure 3.1). No VOCs were detected in deep well MW-18, however, the VOC plume extent was found to reach past MW-19 in the shallow aquifer. Thus, further assessment was performed with the installation of monitoring wells MW-20 and MW-21 in 2011. A sampling of these wells identified VOCs in MW-20, but further down-gradient wells MW-21 and NS-1 (a monitoring well installed by Norfolk Southern to assess a separate off-Site condition) were non-detect for all VOCs and therefore bounded the down-gradient edge of the plume.

Vertical assessment on-Site for VOCs was performed with MW-07D, MW-08D and MW-09D. All on-Site deep wells reported a non-detect condition with the exception of a single detection of TCE in MW-8D at 2.8 µg/L on June 28, 2000. MW-08D was installed one week prior to the sampling and detection of TCE was a probable artifact of the well installation process (*i.e.*, carry

down of contamination during drilling) as TCE was reported in the shallow aquifer at this location (*i.e.*, MW-04). TCE was non-detect in MW-08D during subsequent sampling events supporting this conclusion. As noted, vertical delineation off-Site was performed with MW-18, which has consistently reported a non-detect condition for all VOCs (2009 through 2016).

3.1.2 Soil

3.1.2.1 Investigation Summary

Investigation of the possible release of regulated substances to Site soil was first performed in August 1997 and focused on historical operation areas identified in a Phase II Environmental Site Assessment (Law, 1997). Three soil-based concerns were identified from this initial investigation including (1) total petroleum hydrocarbons (TPH), (2) detection of Aroclor-1260 above the HSRA NC of 1.55 milligrams per kilogram (mg/kg), and (3) detection of soil-bound lead above the HSRA NC of 300 mg/kg. Due to these findings, several iterative investigations were performed starting in 2000 to characterize and delineate each condition including up to the 2011 removal action to address soil-bound lead. A timeline of the soil assessment events is provided below.

Soil Assessment Activity Summary

August 1997	Initial assessment of the potential release of regulated substances to the soil. Comprised of 35 soil borings with the identification of TPH, Arocor-1260 and lead.
February - March 2000	Assessment and delineation of soil at approximately 68 on-Site locations. Testing performed for PAHs, VOCs, PCBs, lead, and chromium.
June 2000	Assessment and delineation of soil at approximately 69 on-Site and 6 off-Site locations. Testing performed for PAHs, VOCs, PCBs, lead, and chromium.
August -September 2000	Assessment and delineation of soil at approximately 14 on-Site and 12 off-Site locations. Testing performed for PAHs, VOCs, PCBs, lead, and chromium.
September 2002 - February 2003	On-Site delineation of lead and benzo(a)pyrene performed to support the CAP work scope and design.
March 2009	On-Site delineation of lead performed to support CAP work scope and design.
July - August 2011	Confirmational sampling program to support the on-Site soil removal action to address lead above the Type 4 RRS.

3.1.2.2 Assessment Findings

This review of soil assessment findings is based on Site information obtained through a review of historical reports, as provided in the 2000 CSR (Arcadis, 2000) and the 2003 CAP (Arcadis, 2003) and serves to summarize past and current findings by the constituent group. For the discussion of soil constituents, delineation is evaluated with respect to the higher of the Site-specific Type I or Type II RRS (*i.e.*, the residential RRS) and remedial action with respect to the Site-specific Type 4 RRS as provided in the approved CAP (Arcadis, 2003).

PCBs

A Site-wide sampling of soil for PCBs identified a single occurrence of Aroclor-1260 above the Site-specific residential RRS (4.3 mg/kg) at sample location HA-7. Perimeter sampling near HA-7 delineated Aroclor-1260 to a non-detect condition or less than the residential RRS. No PCB testing result was reported above the Type 4 RRS (22 mg/kg). Therefore, no further assessment or corrective action was warranted for PCBs based on the intended future land use of the Site as commercial or industrial property.

Metals

The initial Site investigation identified two soil-bound metals, chromium and lead, as requiring further assessment based on a comparison of soil testing results to residential and non-residential RRS. Soil-bound chromium was identified to exceed the residential RRS (230 mg/kg) at four locations: B-04, B-31, B-54, and B-82. Delineation to the chromium residential RRS was performed at three of the four locations. Delineation at the fourth location (B-54), located adjacent to the Site's western property boundary, was not performed to the west which is bound by a rail line. All soil-bound chromium concentrations are below the Site's Type 4 RRS (4,600 mg/kg). Thus, no corrective action was warranted for soil-bound chromium based on the intended future land use of the Site as commercial or industrial property.

Soil-bound lead above the Type 4 RRS (1,300 mg/kg) was identified across the central and eastern portions of the Site. As a result, the soil-bound lead condition required corrective action as described in Section 3.2. Soil-bound lead is delineated to the residential RRS (400 mg/kg) as illustrated in Figure 3.2 with all off-Site perimeter samples less than the residential RRS.

PAHs

Fifteen PAHs were detected in soil during the early Site investigation work of which five – benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene and indeno(1,2,3-c,d)pyrene – were reported above their respective residential RRS. The detected PAHs are delineated to the residential RSS by sample locations at the Site property line (note that one off-Site sample observed as an exceedance of the residential RRS is a soil sample collected as part of the prior background PAH study [Arcadis, 2000]). Of the five PAHs identified above the residential RRS, only benzo(a)pyrene was initially classified as exceeding its Type 4 RRS at three locations: HA-1, B-2, and B-63. Follow-up assessment for these three locations during supplementary investigation to support the CAP work scope was unable to confirm the early Site investigation test results. Soil samples collected immediately adjacent to the original soil borings and in a grid pattern surrounding the original boring were unable to replicate the benzo(a)pyrene test results above the Type 4 RRS. Thus, no corrective action for benzo(a)pyrene, or any other PAH, was warranted and benzo(a)pyrene was removed from the CAP (2003, Arcadis).

VOCs

Assessment of soil-bound VOCs in 2000 did not identify any constituents above the residential RRS as detailed in the 2000 CSR (Arcadis, 2000). Thus, no further assessment of soil-bound VOCs was warranted.

3.1.3 LNAPL

In April 1999, a sampling of MW-2 discovered an accumulation of approximately 3 feet of LNAPL product in the well casing. A sample of the LNAPL product was collected in June 1999 and determined to be characteristic of highly weathered No.2 fuel oil, a conclusion consistent with the historical use of the immediate area for fuel loading and a pump house. The extent of the LNAPL smear zone was assessed in 2000 and 2003 with the installation of 14 TWs (TW-16 through TW-29). In the mid-2000s, a series of 4 additional wells (TW-30, TW-31, TW-33, and TW-34) were installed to assess the down-gradient fringe of the LNAPL smear zone. The LNAPL assessment area and well locations are provided in Figure 3.3.

In 2018, an assessment of the LNAPL condition was performed in accordance with the Interstate Technology and Regulatory Council's (ITRC) LNAPL management process and a determination of LNAPL transmissivity in accordance with American Society for Testing and Materials (ASTM) Method E2856, *Standard Guide for the Estimating of LNAPL Transmissivity*. The findings of these studies and the development of an LCSM are presented in Section 5.5.

3.2 Remedial Action Review

3.2.1 Lead Contaminated Soil

In 2011, a total of 4,917.59 tons of soil and debris were excavated at the Site as described in the 2011 Corrective Action Progress Report (CAPR) (EPS, 2012). Removal activities commenced on July 13, 2011 and were completed on August 31, 2011. The soil removal activities included the excavation of soil above the Type 4 RRS from 0 to 2 feet below ground surface (ft-bgs) in accordance with the CAP, treatment of soils potentially classified as hazardous based on Toxicity characteristic leaching procedure (TCLP) testing, disposal of soils at a Subtitle D landfill and backfilling of the excavated areas with fill from an off-Site clean soil source.

Removal of soil exceeding the Type 4 RRS was attained for all but four sample locations. The four locations not excavated are detailed below.

- Two samples (11225-OO10-0-1SP and 11225-RR21-0-1SR) were located on the edge of the Site property line abutting to the Norfolk Southern right-of-way for railroad lines. Transco did not have the authorization to extend the excavation into the Norfolk Southern property.

- One sample (11225-RR22-0-1SR) was located at the edge of 7th Street. No further excavation could be conducted adjacent to 7th Street as excavation would have undermined the base material of the paved road.
- The final sample that exceeded the Type 4 RRS was from an interior Site location and was inadvertently missed during the removal action planning. That location is bounded on all four sides by soil samples reported below the Type 4 RRS.

The extent of soil removal and location of the four samples reporting lead above the Type 4 RRS are illustrated in Figure 3.4. Assessment of the residual soil condition following the removal action and risk analysis to a future commercial or industrial receptor is provided in Section 6.2.

3.2.2 LNAPL Recovery Action

Two types of LNAPL recovery systems were installed in January 2008 to remove LNAPL product from well casings. The recovery systems comprised of two technologies, free-phase LNAPL skimmer units and continuous hydrophobic belt skimmer units, selected based on their capability to extract LNAPL from a well casing with minimal water withdrawal (*i.e.*, to minimize waste generation) and to extract LNAPL at its natural recovery rate at each well point. A brief description of each system is provided below.

3.2.2.1 Free Phase LNAPL Skimmers

The free-phase LNAPL skimmer units are designed to selectively removed LNAPL product that has accumulated at the air-water interface (*i.e.*, water table) as a result of the LNAPL's lower specific gravity in comparison to water. A hydrophobic membrane mounted on a mobile float, which maintains the position of the hydrophobic membrane at the air-water interface, allows passage of LNAPL product into a reservoir tank mounted at the base of the skimmer unit. LNAPL collected in the reservoir tank was then periodically pumped (pneumatic pump) to a central collection tank on a routine cycle (hourly and then reduced to daily pumping based on the LNAPL recovery rate).

3.2.2.2 Hydrophobic Belt Skimmers

The hydrophobic belt skimmers operated by selectively extracting LNAPL based on the difference in product specific gravity and surface tension in comparison to water. The belt was continuously circulated from ground surface to groundwater level allowing LNAPL to physically adhere to the belt as it circulated within the extraction well. The belt transports the adhered LNAPL to the surface where it is physically scraped from the belt and deposited in an oil-water separator tank. LNAPL in the oil-water separator tank was then gravity drained to a collection drum for recycling. This system operates independently of changing water table depth since the belt can be set up to extend to full well depth.

3.2.2.3 Extraction Well Placement and System History

The placement of the extraction wells was based on the spatial distribution of LNAPL from historical and current observations at the time of installation in January 2008. Five existing 2-inch monitoring wells (MW-2, TW-17, TW-18, TW-19 and TW-20) were adapted for use as extraction wells and five new 2-inch extraction wells (EW-10 to EW-14) were installed for a total of ten LNAPL recovery wells. The layout of the system is provided in Figure 3.5 and the history of the LNAPL system and system modifications is summarized below.

LNAPL Recovery System History

Date	Action
January 2008	10 LNAPL recovery units online; 5 belt skimmer units and 5 free-phase skimmer units
September 2009	Free-phase skimmer units are modified with 46" float guide from standard 22" float guide due to highly variable water table; two belt skimmer units modified with alternate belt type in an attempt to improve product recovery
2010	LNAPL skimmer located at TW-20 is relocated to TW-19. Belt skimmer units decommissioned; LNAPL recovery from belt skimmer units insignificant for two years; manual recovery performed quarterly
2013	Free-phase skimmer units decommissioned; LNAPL recovery from units insignificant; manual recovery performed quarterly
2013 – 2016	Manual LNAPL recovery only

3.2.3 Groundwater Lead Monitoring

Groundwater assessment for dissolved lead comprised of annual monitoring from 2009 through 2016 to determine if the soil-bound lead was leaching to the underlying aquifer. The CAP specified nine monitoring wells located within or adjacent to Site areas exhibiting elevated soil-bound lead concentrations to be sampled: MW-4, MW-12, MW-13, MW-14, MW-15, MW-30, MW-31, MW-32, and TW-04 (Figure 3.6). All nine monitoring wells in the groundwater monitoring program were sampled annually, and all monitoring wells have reported a non-detect condition for dissolved lead (5 µg/L detection limit) indicating soil-bound lead was not leaching at a detectable level. The routine groundwater sampling program for the lead was discontinued following acceptance of the Site into the VRP.

3.2.4 Groundwater VOC Monitoring

Prior to entering the VRP, groundwater monitoring was performed to assess VOCs according to the approved CAP (Arcadis, 2003). Groundwater VOC monitoring comprised of two years of quarterly monitoring (August 2009 to August 2011) followed by annual monitoring (2012 to 2016) for the purpose of time trend analysis and assessment of MNA potential. A summary of VOC testing results is provided in Table 3.2.

The CAP specified 16 wells to be sampled for VOC assessment: MW-4, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16, MW-17, MW-18, MW-19, MW-20, MW-21, TW-01, TW-03, TW-04 and TW-08 (Figure 3.7). Horizontal delineation of chloroethene VOCs has been performed, with the plume bounded to the south by MW-11 and MW-17, to the east by MW-16, MW-20, and MW-21, to the west by MW-3, TW-4, and MW-11 and to the north by MW-13 and MW-14. MW-14 exhibits intermittent detection of carbon tetrachloride (CT) and is the only well to report CT. MW-14 does not report the detection of chloroethenes. Annual evaluation of VOC plume stability and MNA potential was last performed for the 2016 CAPR (EPS, 2017). The evaluation found limited to adequate evidence for MNA based on (i) an analysis of VOC plume stability that determined the on-Site and off-Site plume condition is stable with no observed plume migration; and (ii) occurrence of VOC degradation products (EPS, 2017).

4 CONSTITUENTS OF CONCERN AND RISK COMPARISON VALUES

4.1 Soil and Groundwater Risk Reduction Standards

Site RRSs were developed and approved for regulated constituents detected in the soil and groundwater in the 2000 CSR (Arcadis, 2000) and later revised in the 2003 CAP (Arcadis, 2003). RRS revisions in the 2003 CAP accounted for the following factors:

- the TCE groundwater RRS was updated with new toxicity values;
- carcinogenic PAHs were adjusted based on the toxicity equivalent factor approach; and
- the soil-bound lead Type 4 RRS was updated based on the Georgia Adult Lead Model (GALM) with a detection limit of 5 µg/L.

4.2 Corrective Action Objectives

COCs are those constituents that exceed an RRS. The approved 2003 revised CAP refined the list of COPC to four COCs requiring corrective action and established corrective action objectives for each (Arcadis, 2003). The Site corrective action objectives by media are summarized below.

Site Corrective Action Objectives

COC	Media	Objective	Basis
Lead	Soil	1,300 mg/kg	Type 4 RRS
Vinyl Chloride	Groundwater	3.2 µg/L	Type 4 RRS
Trichloroethene	Groundwater	7.2 µg/L	Type 4 RRS
Naphthalene	Groundwater	20 µg/L	Type 4 RRS

5 CONCEPTUAL SITE MODEL

5.1 Regional Geology

The Site falls in the upper Coastal Plain Physiographic Province just south of the Fall Line in central Georgia. The Coastal Plain Physiographic Province is characterized by sequences of late Mesozoic and Cenozoic sediments consisting of marl, sands, clays, and limestones. The topography of the region is mostly flat with shallowly sloping hills and discontinuous ridges.

Regional stratigraphy consists primarily of the Tuscaloosa Formation locally overlain by the Eutaw Formation and underlain unconformably by shallow, southeastward dipping crystalline rocks of the Piedmont (Pollard and Vorhis, 1980). The Tuscaloosa Formation is a Cretaceous age, locally cross-bedded, and a southward-thickening wedge of sediments. The formation is composed of gravelly, fine to coarse sand with localized pockets or lenses of iron-stained kaolinitic, micaceous sandy clays.

Adjacent to the Ocmulgee River, alluvial sediments (Pleistocene to Recent) overlie the Tuscaloosa and other undifferentiated Cretaceous material comprise the youngest sediments in the area. East of the Ocmulgee River, massive, deep red, clayey sands of the Barnwell Formation can be found slumped and draping over the Tuscaloosa in inter-stream areas (LeGrand, 1962).

In the Macon vicinity, surficial soils consist of sands and clays. Generally, soils of central to south Macon are a weathering product of the Cretaceous sediments. To the north, soils are typically a weathering product of the crystalline Piedmont bedrock. Alluvial deposits ranging from Pleistocene to recent ages exist along the Ocmulgee floodplain up to one mile from the river's banks. These deposits are primarily unsorted sand, gravel, and clay and measure up to 40 feet (ft) thick (LeGrand, 1962). The Quaternary alluvium near Macon is comprised of unconsolidated alluvial sand, silty to clayey sand, sandy silt, and sandy clay with rare wood debris (natural). Quaternary alluvium thickness averages 6 ft with a range of 2 to 20 ft in thickness. Depth to the top of this unit averages 5.5 ft-bgs with a range of 1 to 9 ft-bgs.

The undifferentiated Cretaceous near Macon consists of clay (often mottled), sandy clay, clayey sand, fine to coarse sand, and fine gravel with rare wood debris (natural). The thickness of this unit averages 23 ft with a range of 6 to 49 ft in thickness. Depth to the top of this unit averages 14 ft-bgs with a range of 8 to 26 ft-bgs. The upper bedrock zone is saprolitic and consists of fine-grained clayey sand, sandy silt, and sandy clay to claystone that grades to more competent partially weathered rock with apparent foliation and finely banded gneiss. Depth to the top of bedrock saprolite averages 62 ft-bgs with a range of 58 to 66 ft-bgs.

5.2 Site Geology

Site geology (from the ground surface to depth) consists largely of fill, Quaternary alluvium, undifferentiated Cretaceous sediments (Blufftown/Eutaw formation overlying the Tuscaloosa formation) and crystalline bedrock. Fill is unconsolidated and consists of lumber debris, metal debris, sands, coal fragments, and minor gravel. These manmade materials are mixed with alluvial sand, silty sand, sandy silt and sandy to silty clay.

5.3 Surface Water Features

No surface water bodies are present on-Site. A large subsurface storm water drainage structure is present beneath the southern portion of the Site. The feature is not accessible on-Site. The subsurface drainage structure daylights east of 7th Street on Norfolk Southern property. The nearest down-gradient water body is the Ocmulgee River, located approximately 4,000 ft north of the Site (Figure 1.1).

5.4 General Hydrogeologic Conditions

5.4.1 Site Geologic and Hydrogeologic Setting

Borehole logging from soil cores and monitoring well installation indicates three hydrogeologic zones exist at the Site (Arcadis, 2000). The upper zone includes the fill, alluvium, and sand in the shallow portions of the upper Cretaceous zone. These materials consist of loose clayey sand, fine to medium to subangular sand, and fine gravel with minor clay, sandy clay, clayey sand, and sandy silt. Lumber debris and coal fragments and fines are observed in the upper zone as well. The upper zone has a Unified Soils Classification System (USCS) classification that is predominantly SP and SM. This zone averages 18 ft thick with a range of thickness from zero to 28 ft. The middle zone is undifferentiated Cretaceous and is comprised of mottled silty clay, sandy clay, and clay with minor wood debris (natural), clay and gravel. The middle zone has a USCS classification of SC, CL, and minor SM. This zone averages 44 ft thick with a range of thickness from 34 to 58 ft-bgs. The average depth to the top of this zone is 18 ft-bgs ranging from zero to 28 ft-bgs. The lower zone consists of sand and gravel in the lower portion of the undifferentiated Cretaceous, saprolitic bedrock and jointed/fractured partially weathered bedrock. The basal upper Cretaceous is represented by sand and gravelly sand with minor clay (USCS: SP, GP, and CL). Saprolitic bedrock is characterized as consolidated to semi-consolidated sandy silt, clayey sand and sandy clay (USCS: SM, SC, and CL). More competent and partially weathered bedrock samples revealed fine-grain gneiss and foliated fine-grained diabase. The average depth to the top of this zone is 62 ft-bgs with a range from 58 to 66 ft-bgs.

5.4.2 Groundwater Direction and Flow Velocity

Groundwater flow direction has been assessed annually since 2009 and mimics the ground surface topography, moving east across the Site, then turning southeast near 7th Street. The potentiometric surface for 2016 is provided in Figure 5.1. The hydraulic gradient is approximately 0.017 ft/ft on-Site and 0.024 ft/ft east of the Site near the core of the VOC plume. The hydraulic properties of the near-surface aquifers were evaluated with slug testing by Arcadis for the CSR (Arcadis, 2000). The upper hydrogeologic zone has a horizontal hydraulic conductivity range of 0.7 ft per day (ft/day) to 6 ft/day with an average of 3 ft/day. The lower hydrogeologic zone has a horizontal hydraulic conductivity range of 6 to 110 ft/day with an average of 75 ft/day. Using the hydraulic conductivity from the falling head permeability test, and the measured Site hydraulic gradient (0.017 ft/ft), and an assumed effective porosity of 20%, the groundwater velocity in the upper aquifer is calculated to be approximately 75 ft/year.

5.5 LNAPL Assessment

5.5.1 Overview

The framework for LNAPL management has evolved over the past decade to recognize that LNAPL remedial objectives require evaluation with respect to technical factors including LNAPL recoverability, mobility, and Site-specific risk concerns (ITRC, 2009). The revised framework was developed to replace the arbitrary threshold limits common to existing LNAPL regulatory programs that in most instances are not technically feasible and to support defining a practical endpoint for LNAPL remediation, customarily referred to as the "maximum extent practicable" or MEP. The ITRC LNAPL guidance has established a framework for determining appropriate site-specific LNAPL remediation objectives and achievable endpoints, with each objective specific to a risk concern (ITRC, 2009). The four steps of the ITRC framework are:

1. establish an LCSM based on LNAPL properties, status, and potential risk concerns;
2. establish appropriate site-specific and achievable LNAPL remedial objectives that address each LNAPL risk concern;
3. develop an LNAPL remedial strategy to achieve the LNAPL remedial objective; and
4. establish an acceptable outcome if the LNAPL remedial objective is attained (e.g., no further action, UEC, or a combination of outcomes).

Ten years of LNAPL monitoring, recovery and evaluation, including recent direct testing of LNAPL properties, provide sufficient data to establish a detailed LCSM and to evaluate practicable Site-specific LNAPL remediation objectives or the MEP, Steps 1 and 2 above. This section focuses on Site-specific information and LNAPL data to complete these two steps. Step 3, a strategy to achieve the LNAPL remedial objectives is considered congruent with the recovery and monitoring activities performed to date under the CAP. The last step, determining an acceptable outcome based on the work performed to date and understood risk concerns is evaluated in Section 6.

5.5.2 The LCSM

This section outlines the key elements of the LCSM based on Site history and Site-specific LNAPL testing data.

A. Site Setting

As provided in Section 1, the Site is located in an industrial area with land use adjacent to and surrounding the facility zoned industrial and/or railroad related. Eventual Site reuse is limited to commercial/industrial redevelopment, which is consistent with other approved Site-specific remedial objectives (*e.g.*, lead-contaminated soil was managed to a Type 4 RRS). The Site and surrounding industrial/commercial properties are supplied water by the local municipality, and no known drinking water supply wells are present in the immediate vicinity (see Section 5.6.2).

B. LNAPL Source

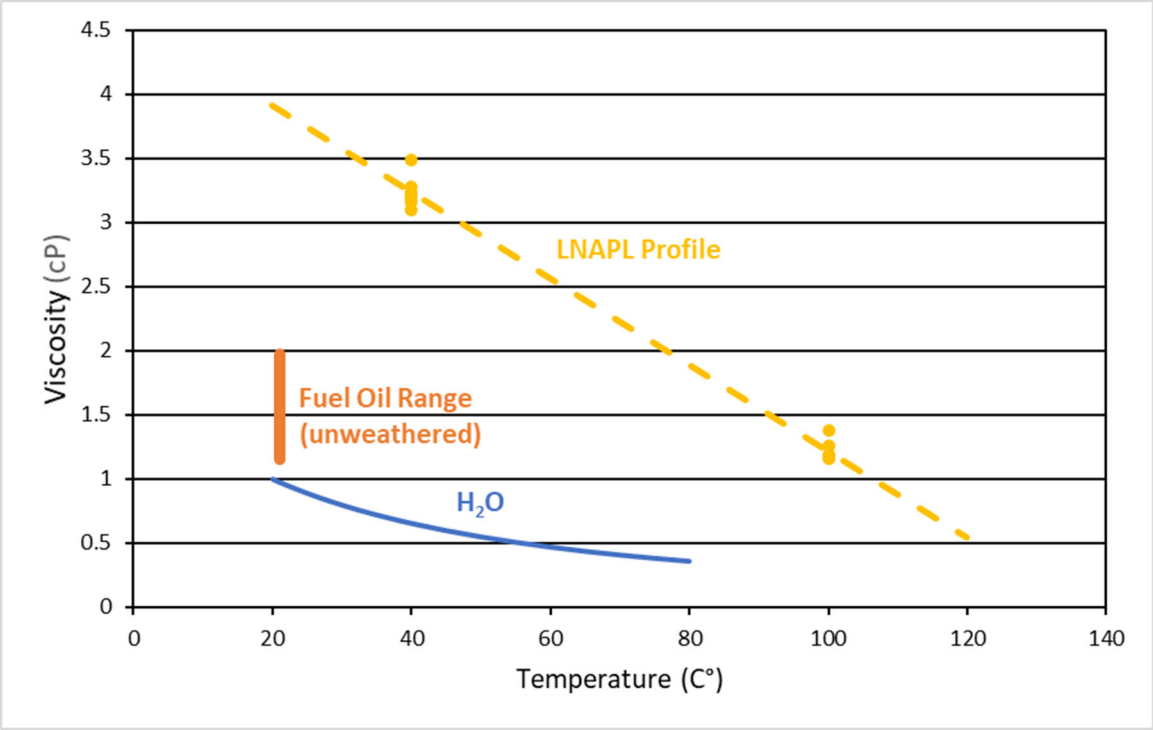
The release of the diesel LNAPL occurred prior to 1980, which marked the removal of the former on-Site AST fuel oil tanks. No ongoing source of LNAPL is present on-Site.

C. LNAPL Physical/Chemical Properties

A renewed effort to characterize the LNAPL product was undertaken in 2018 to better understand its current physical and chemical properties. The effort included testing of the LNAPL viscosity and chemical composition, information useful for understanding the LNAPL's behavior in the subsurface and potential risk concerns. To assess LNAPL viscosity, LNAPL product was collected from seven well casings across the LNAPL smear zone (EW-10, EW-13, MW-02, TW-12, TW-18, TW-19, and TW-24) and submitted for laboratory testing. The laboratory report is provided in Appendix E.

The LNAPL viscosity ranged from 3.59 to 4.05 centipoise (cP) at 40°C or about six times that of water. When heated to 100°C, the LNAPL viscosity decreased and ranged from 1.34 to 1.6 cP, or still about 2.5 times that of water. Thus, the Site's LNAPL resistance to potential subsurface flow is substantially impeded in comparison to water and will have a direct influence on mobility and recoverability. Furthermore, the viscosity supports the prior assessment that the LNAPL represents a weathered product that has undergone chemical and physical alteration since its release. This difference of LNAPL product viscosity relative to water and unweather fuel oil range organics is illustrated graphically below.

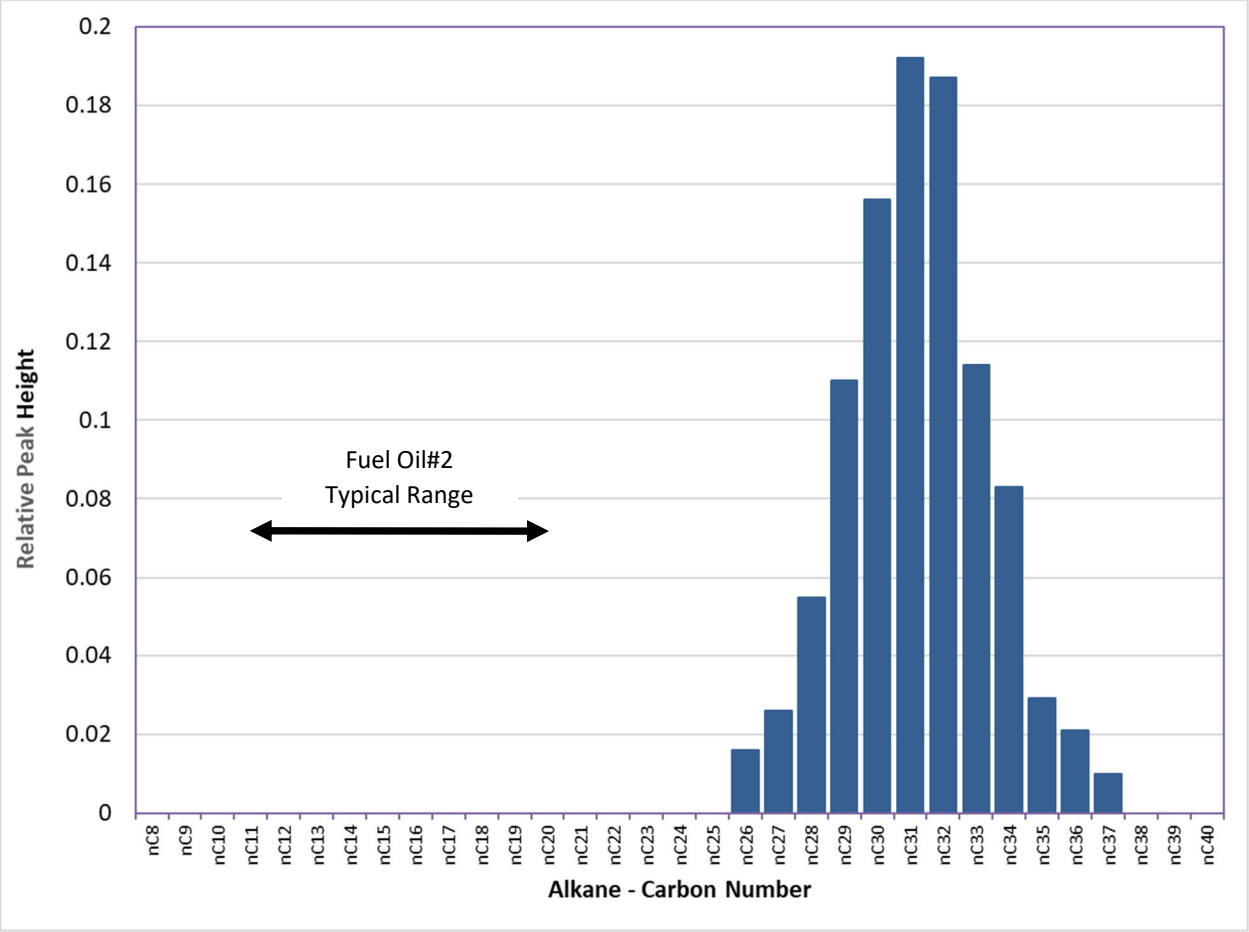
LNAPL Product Viscosity Analysis Results



Also in 2018, the chemical composition of the LNAPL product was assessed to better understand not only its key constituent groups but how the observed constituent groups may affect the surrounding aquifer through the potential release of soluble constituents. The latter concern of soluble constituents was directly assessed by testing of groundwater in monitoring wells adjacent to and down-gradient of the LNAPL smear zone area (Section 5.5.4).

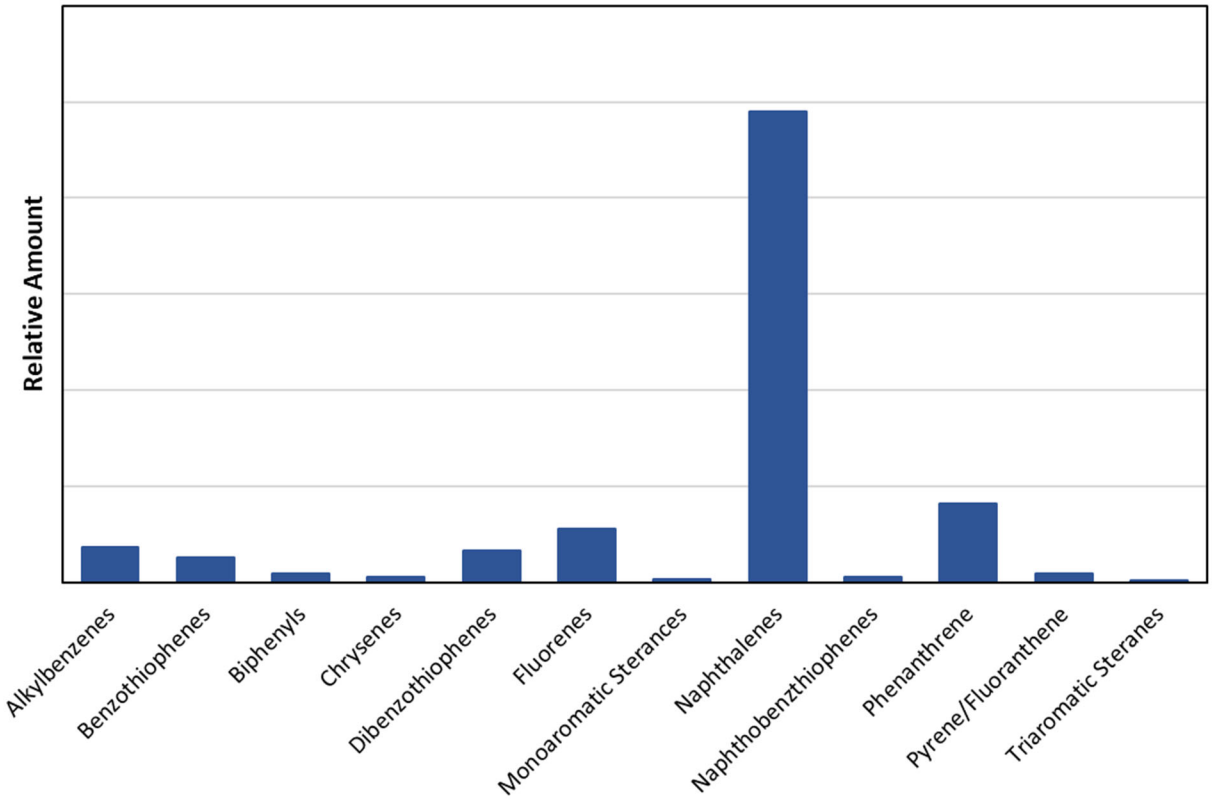
LNAPL product composition was tested with ASTM Method D5739, which provides a semi-quantitative molecular characterization by gas chromatography/mass spectrometry (GC/MS) for C8 through C40 compounds (*i.e.*, hydrocarbon compounds with 8 to 40 carbon atoms). Two key findings from this study provide insight into the status of the LNAPL. First, with respect to the LNAPL alkane profile, the analysis finds the LNAPL hydrocarbon profile to be highly weathered with no hydrocarbon chains less than C26. This is substantially skewed from the expected profile for fuel oil #2, which is characterized by chain lengths in the C11 to C20 range (ATSDR, 1999). In fact, the Site LNAPL alkane profile is at the high-end for any fuel type and is more in line with residual and recalcitrant petroleum compounds. The alkane distribution for the Site LNAPL is illustrated below.

LNAPL Product Alkane Profile



Second, the current aromatic compound distribution is notably skewed towards naphthalene and naphthalene congeners with phenanthrene and fluorenes identified as the second and third most prevalent aromatic hydrocarbon groups although at significantly lower relative amounts. This aromatic distribution profile for the LNAPL product provides a sound explanation for the historical detection of PAHs in past groundwater samples collected within the LNAPL smear zone. Specifically, historical detections of PAHs were limited to these aromatic groups and included detection of four specific PAHs: naphthalene, acenaphthylene, fluorene, and phenanthrene.

LNAPL Product Aromatic Hydrocarbon Profile

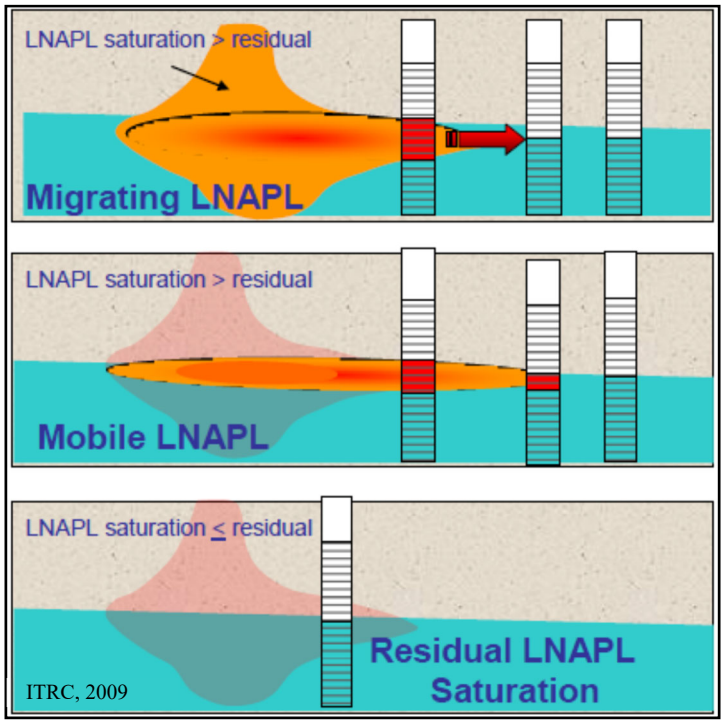


D. LNAPL Delineation

The extent of LNAPL product is delineated within the existing monitoring well network as illustrated by periphery wells that either exhibit no product or occasionally report minute or trace levels of LNAPL product (Figure 5.2a). Figure 5.2a illustrates the frequency of detection for LNAPL in well casings for the period of 2008 through 2016. Periphery monitoring wells report no detection of LNAPL product with the exception of three locations: TW-22, MW-32, and TW-26. Although these three periphery wells have reported LNAPL product during monitoring events, the quantity of LNAPL observed in these wells averages 0.14 ft to 0.20 ft for the period of 2008 to 2016 (Figure 5.2b) and for the past two years the maximum LNAPL product in these periphery wells ranges from non-detect (TW-26) to a maximum of 0.04 ft (TW-32) as shown in Figure 5.2c and summarized in Table 5.1.

The core of the LNAPL product has remained centered primarily along the transect of monitoring wells from TW-18 to TW-28 since 2008 (Figure 5.2b) with some accumulation of LNAPL at greater than one-foot in wells to the southeast (TW-19, TW-23, TW-24, and SSB-1). This LNAPL profile is consistent with recent LNAPL measurements in 2015 and 2016 (Figure 5.2c), indicating the LNAPL plume is stable with no observed migration.

E. LNAPL Mobility & Saturation



LNAPL mobility is classified as one of three conditions as detailed in the ITRC guidance and illustrated herein. The key characteristic for classifying LNAPL mobility is the LNAPL residual saturation; LNAPL above its residual saturation limit has the potential to be mobile, whereas LNAPL below its residual saturation limit is immobile.

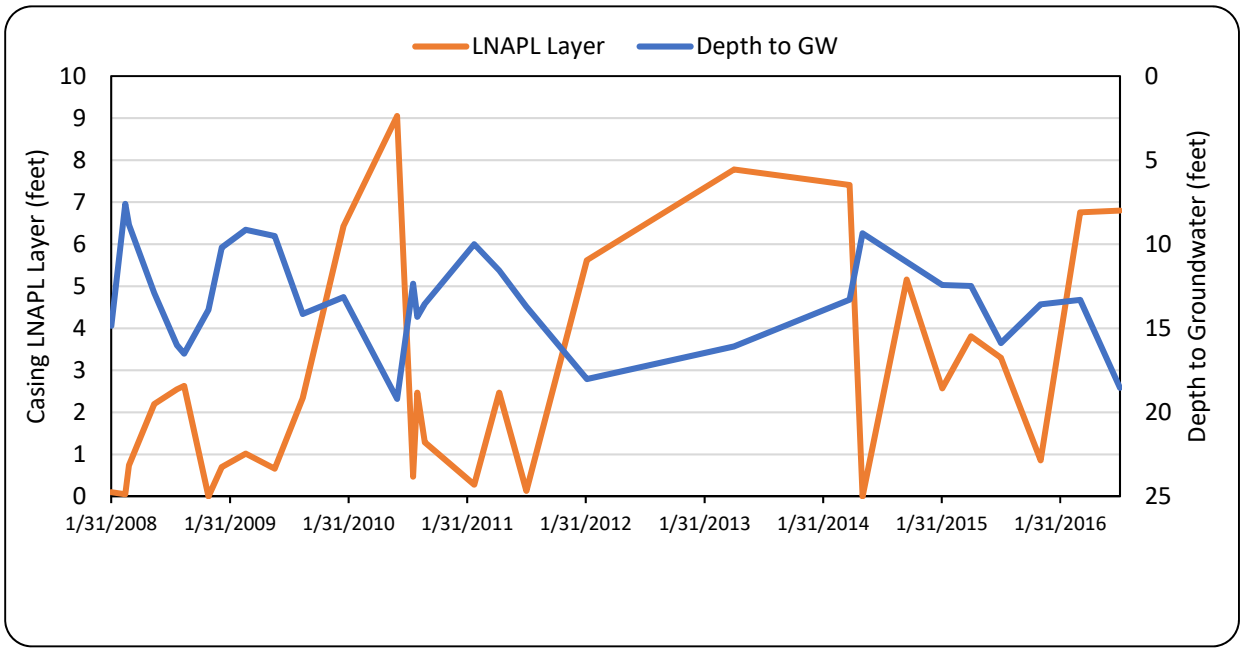
The first LNAPL classification is one of migrating LNAPL, in which LNAPL is observed to spread in the subsurface, horizontally over time. This condition may be observed when a source of LNAPL is present or recently released and thus having sufficient hydraulic head and saturation (*i.e.*, above residual saturation) to continue to migrate outwards and displace groundwater from pore space. The second classification is mobile LNAPL. Mobile LNAPL also exceeds residual saturation but does not migrate horizontally as there is no LNAPL head. Vertical movement of mobile LNAPL can occur and is subject to LNAPL residual saturation, which is not equal for the vadose zone and saturated zone of the aquifer, and therefore mobile LNAPL responds to water table fluctuations. The last classification is residual LNAPL or LNAPL that is less than the LNAPL saturation level. At less than saturation, LNAPL is entrained or trapped within aquifer pore space.

Site LNAPL is well-documented through prior delineation efforts and annual monitoring to be horizontally stable. Therefore, the Site LNAPL does not exhibit properties of a migrating LNAPL plume. This is consistent with the understood age of the plume (the release occurred prior to 1980) and lack of an ongoing source of LNAPL to the subsurface. The historical dataset does exhibit properties consistent with mobile LNAPL (vertical mobility) as documented in measurements of variable LNAPL thickness in monitoring well casings. Analysis of the LNAPL well casing thickness with respect to the water table elevation finds an inverse relationship between the two. This observation indicates that Site LNAPL occurs at less than residual saturation under high water table conditions and exhibits vertical mobility only during periods of low water table elevation. Three examples illustrating Site LNAPL saturation properties and vertical mobility as a function of the Site water table status are illustrated below.

EW-10

EW-10 was installed in 2008 to increase the number of LNAPL recovery points. The time series of measurements for EW-10 illustrate a characteristic dependence of LNAPL well casing accumulation and water table elevation. For example, four events are noted where the water table was at a shallow point or less than 10 ft-bgs: March 2008, March 2009, February 2011 and June 2014. The corresponding LNAPL thickness for these periods reports trace to less than 1 ft of product in the casing. The inverse condition is noted for periods of low water table (*i.e.*, greater LNAPL thickness).

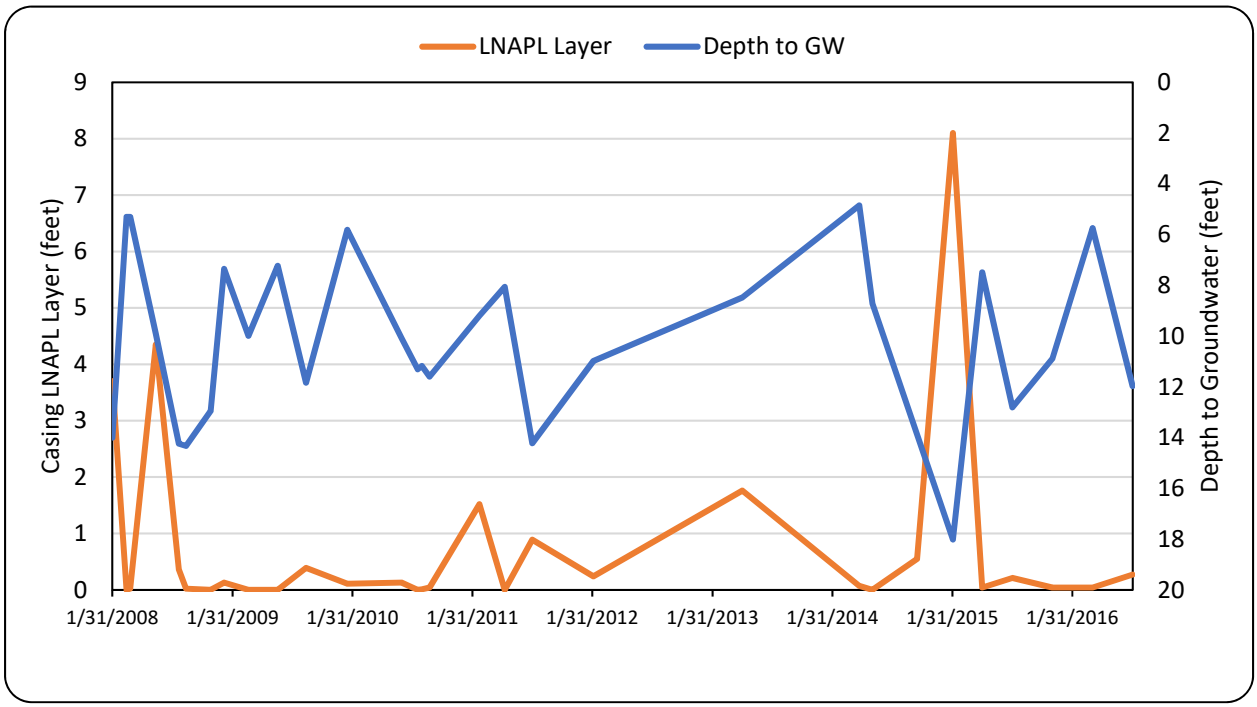
EW-10 Time Series Data



TW-17

TW-17 historically exhibits little accumulation of LNAPL product with several monitoring events finding no LNAPL product present in the casing. An exception to the historical pattern occurred in 2015 during which the water table at TW-17 declined to the lowest observed level from 2008 to 2016 (approximately 4 ft less than any other measurement). Coinciding with the drop in the water table was an accumulation of LNAPL in the casing, on the order of 8 ft of LNAPL. This observation indicates that LNAPL in the adjacent aquifer is below residual saturation under typical water table conditions but is above residual saturation and vertically mobile when the water table drops (*i.e.*, when the vadose zone expands).

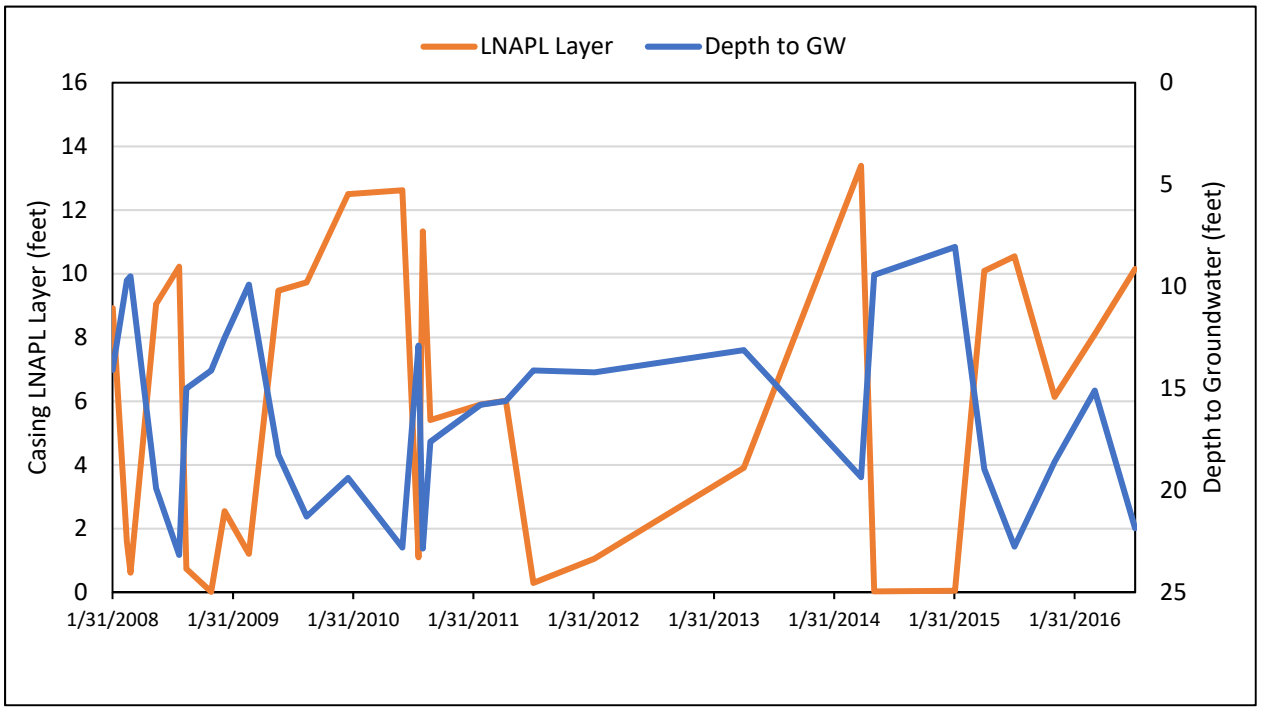
TW-17 Time Series Data



TW-18

TW-18 historically exhibits the thickest accumulation of LNAPL amongst all Site monitoring wells. The time series of measurements for TW-18 illustrates a well-defined relationship between LNAPL accumulation in the well and groundwater elevation. A notable period in the time series occurred in 2014 when the water table elevation was at its shallowest level (8 to 9 ft-bgs) reducing the width of the vadose zone; a condition that increases LNAPL residual saturation (*i.e.*, the saturated aquifer matrix retains more LNAPL) and reduces LNAPL mobility. During this period, LNAPL was nearly absent from the well casing and no LNAPL was recoverable. A contrasting condition occurred in 2010, in which the water table was sustained at a historical low.

TW-18 Time Series Data

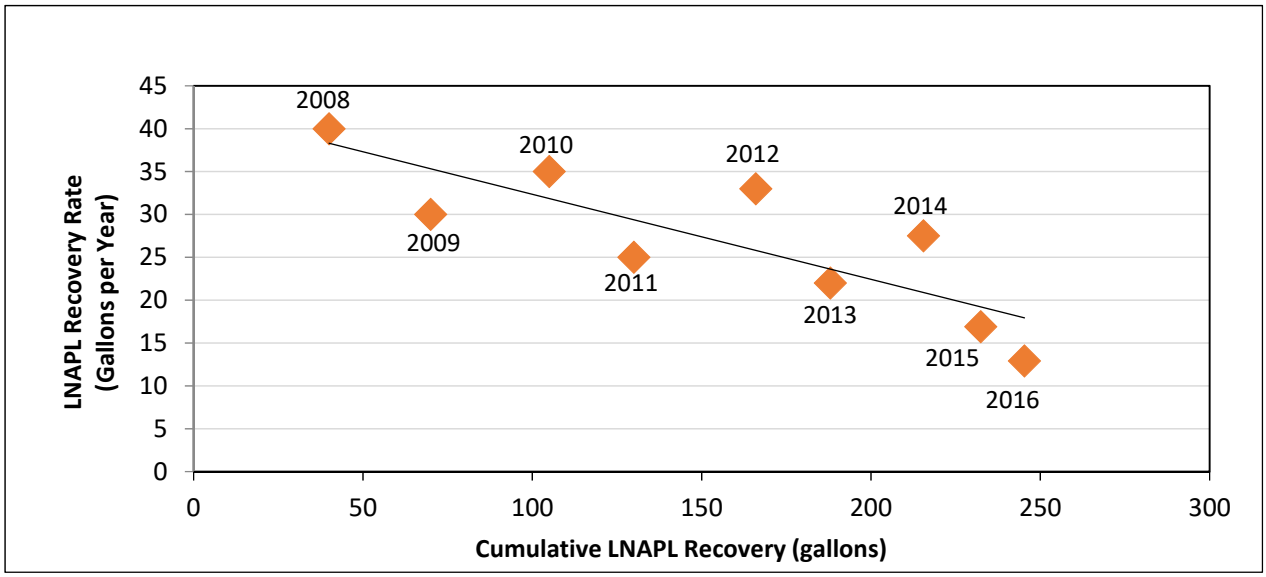


5.5.3 LNAPL Recoverability Assessment

5.5.3.1 LNAPL Recovery Decline Curve Analysis

An initial assessment of potential LNAPL recoverability was performed and presented in the VIRP following ITRC LNAPL guidance. The ITRC assessment method, the LNAPL recovery decline curve analysis, is designed to utilize historical LNAPL recovery system data to predict the total LNAPL that is potentially recoverable and is based on the annual LNAPL recovered in comparison to the cumulative LNAPL product recovered. A Site-specific LNAPL recovery decline curve analysis is graphically illustrated below and is based on nine years of data for total product recovered from fourteen monitoring/recovery wells.

LNAPL Recovery Decline Curve Analysis



Two LNAPL recovery parameters are acquired from the analysis. First, the LNAPL product recovery rate declined by approximately 60% in 9 years, from 40 gallons per year (gpy) in 2008 to less than 15 gpy in 2016. Second, the maximum quantity of recoverable LNAPL can be estimated by extending the recovery rate trend line to zero, at which point no further recovery is predicted. Extending the recovery rate trend line to zero, or the point of no further recovery, the maximum Site-specific LNAPL product potentially recoverable is estimated at approximately 425 gallons. Currently, 245 gallons of LNAPL have been recovered.

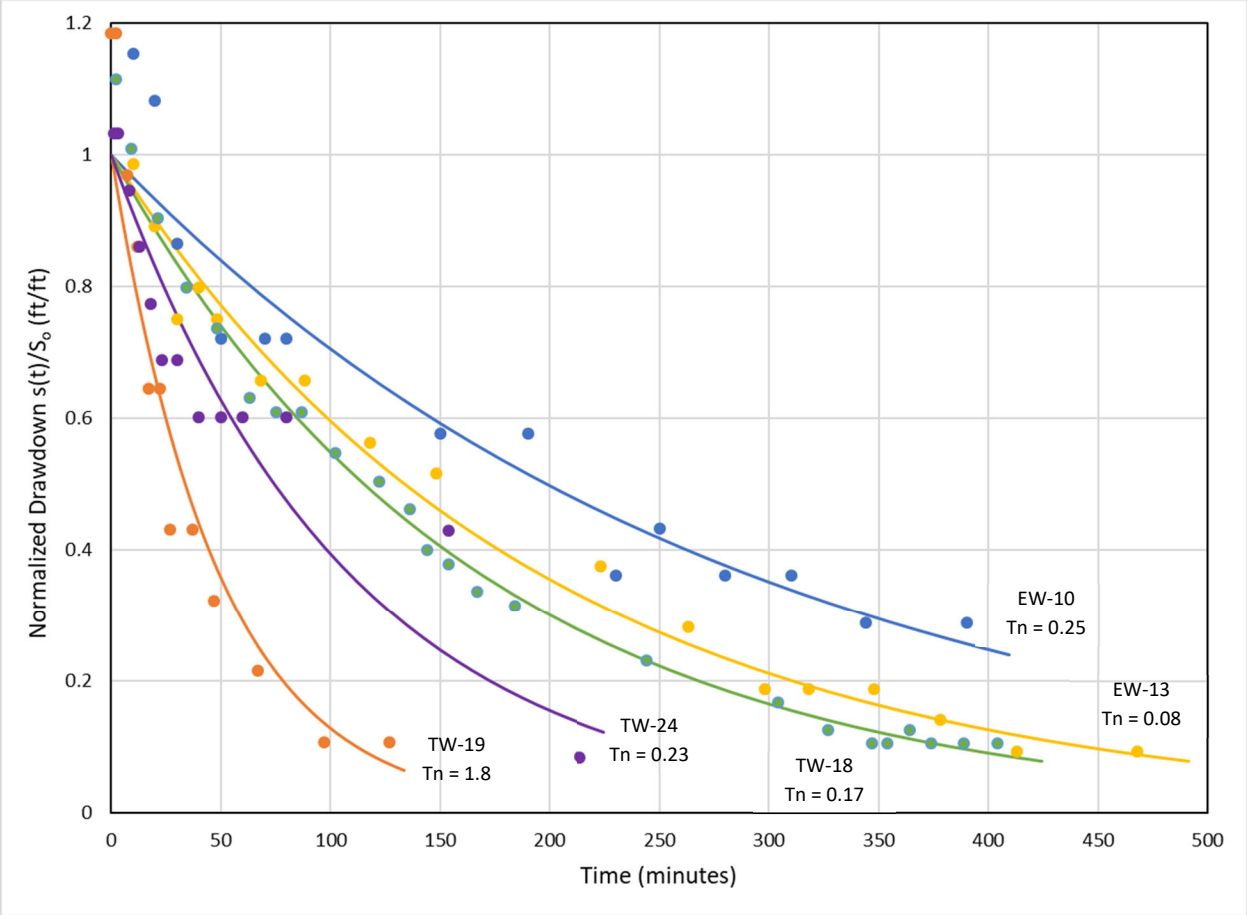
5.5.3.2 LNAPL Transmissivity Testing

In 2018, further assessment of the Site LNAPL condition was performed based on the growing body of evidence that LNAPL transmissivity, a measure of the lateral mobility of the LNAPL free product in the subsurface, provides the most practicable assessment of LNAPL recoverability and indicator of whether an MEP endpoint has been reached. Specifically, an LNAPL transmissivity between the range of 0.1 ft^2/day and 0.8 ft^2/day is the lower threshold limit, below which remedial action with standard hydraulic recovery technologies are concluded to have reached a useful end-point and further action is not merited unless an exposure risk concern is identified in the CSM.

Site LNAPL transmissivity was evaluated with ASTM Method E2856. Specifically, field data was acquired in accordance with the baildown test method of ASTM E2856 and data analysis was performed with the *API Transmissivity Workbook* (API, 2016). Transmissivity testing location preference included 2-inch well casings that exhibited a minimum of 0.5 ft of LNAPL product. One 1-inch well (TW-24) was also assessed for LNAPL transmissivity due to a lack of well casings with sufficient product (>0.5 ft) to perform the baildown test method. In total, sufficient baildown test data was acquired from five wells to calculate LNAPL transmissivity (data collected from a 6th well exhibited anomalous results). Field forms for collection of baildown data are provided in Appendix F and the output of the *API Transmissivity Workbook* are provided in Appendix G

The transmissivity analysis results, based on the Bouwer & Rice Type Curve (Bouwer & Rice, 1976), are graphically illustrated below and find that four of the five wells exhibit a transmissivity value of 0.08 to 0.28 ft^2/day. One well, TW-19, exhibited an outlier transmissivity value of 1.8 ft^2/day. The anomalous value at this location in comparison to the remainder of the LNAPL smear zone indicates other factors may be influencing the testing result. For example, an underestimate of LNAPL recharge from the sand pack can result in an overestimate of actual LNAPL recoverability.

Transmissivity Model Results: Bower & Rice Type Curves



The ITRC-based approach finds that LNAPL recovery by current means has reached a defensible endpoint based on two key metrics, (1) the LNAPL recovery decline curve analysis and (2) the LNAPL transmissivity which identified Site LNAPL transmissivity values within the range of impracticability for effective LNAPL recovery (*i.e.*, < 0.1 to 0.8 ft^2/day).

5.5.4 Groundwater Testing for LNAPL Constituents

Concern regarding potential LNAPL constituents in groundwater, specifically naphthalene, was recognized during early sampling of MW-02 in 1997 through 1999. It was later recognized that LNAPL product is routinely observed in MW-02 and the location was later used as part of the

LNAPL recovery system. Therefore, the historical detection of naphthalene and other PAHs in MW-02 was likely a result of direct water-LNAPL contact in the well casing. Prior to the current assessment, Site-wide sampling for naphthalene and PAHs was last performed in 2003 with only a single trace detection of naphthalene in MW-04 at 1.1 µg/L with wells adjacent to the LNAPL smear zone reporting a non-detect condition. Testing of MW-04 in 2007 did not reproduce the naphthalene detection.

The VIRP outlined a plan to test five wells down-gradient of the LNAPL smear zone for dissolved LNAPL constituents. The objective of this sampling was to address the LNAPL risk concern of a potential dissolved plume. The sampling included locations MW-01, TW-01, TW-08, TW-31 and TW-33 (Figure 5.3). The testing was performed on January 22, 2019, and each groundwater sample was analyzed with EPA Method SW8270D (SIM Polynuclear Aromatic Hydrocarbons). The field and laboratory data report are provided in Appendix H and Appendix E, respectively.

The results of the testing found one of the five wells, the well nearest the down-gradient edge of the LNAPL smear zone, TW-33, to report a range of PAHs with a majority of the test results below 1 µg/L (Table 5.2). The four remaining wells were non-detect for all PAH constituents with the exception of a single detection of pyrene in TW-08 at 0.4 µg/L. TW-08 is due east of TW-33 as is the Site groundwater flow. Thus, all PAH constituents are delineated to a non-detect condition in down-gradient or side-gradient wells or below the Type 1 RRS (1,000 µg/L) in the case of pyrene in TW-08.

5.6 Potential Receptors and Exposure Pathways

5.6.1 Facility and Surrounding Area

The Site is located in an industrial area southeast of downtown Macon, Georgia. No structures exist on-Site except for a former multi-story coal chute and security fencing to control access. The Site is currently vacant but may be occupied by a future owner. Land use immediately adjacent to the Site is zoned industrial and is primarily railroad related, with several surrounding land parcels designated a public utility due to their use to support public works or railway infrastructure. The nearest residential area includes a two-family housing neighborhood located approximately 2,000 feet west of the Site (hydraulically upgradient).

5.6.2 Well Survey

A review of the EPD records to update the Site's original well survey was performed on December 17, 2018. No drinking water sources were identified within a ½-mile radius of the Site or within a 3-mile zone downgradient of the Site (Appendix I). This finding is supported by a recent EPD Trip Report dated October 9, 2018, for a site located at 1217 Martin Luther King Jr. Blvd. The 1217 Martin Luther King Jr. Blvd site is located just 1,200 feet west of the Site and the EPD Trip Report did not locate a drinking water well within a 1-mile radius (Appendix I). Therefore, the downgradient groundwater pathway was excluded from consideration. Regardless, a restriction on the future use of groundwater at the Site is included in the proposed UEC.

5.6.3 Potential Human Receptors

5.6.3.1 On-Site Receptors and Exposure Pathways

The Site is located in a zoned industrial area with no reasonable expectation of residential occupation. Thus, on-Site receptors (current and potential future) include Site Workers, Trespassers, and Construction Workers. On-Site receptors might be exposed to COCs via dermal exposure, ingestion, and inhalation, or possibly through vapor intrusion (possible indoor air exposure/inhalation) if future structures were to be constructed and occupied. A summary for each potential Site receptor is provided below.

- Current/Future Site Worker: It is anticipated that the Site will continue to remain industrial based on the surrounding property use, zoning restrictions, and its physical location being bound by active railroad infrastructure. Site workers associated with this type of land use can potentially have long-term exposure to Site-related chemicals in surface soil via particulate ingestion and dermal contact. Concrete or asphalt coverings may prevent worker exposure to residual lead contamination in the underlying soil. For VOCs, exposure to Site workers is more likely to occur via the inhalation of volatiles in indoor air if the Site is redeveloped. Suitable engineering measures are available to control vapor intrusion should future land use involve the construction of an enclosed building. Thus, exposure to Site Workers can be managed according to appropriate land use protocols.
- Current/Future Construction Worker: Construction workers could potentially have short-term (<1 year) exposure to COCs in mixed surface and subsurface soil (0 to 10 ft-bgs) via ingestion, dermal contact, and inhalation of volatiles and particulates. The distribution of soil and groundwater contaminants is well understood for the Site with the current monitoring well network establishing the bounds of VOCs and LNAPL, and the extensive soil delineation activity characterizing the residual soil lead condition. Site data is captured in a Geographic Information System (GIS) that will allow future Site reuse to be planned with respect to residual COC conditions. Therefore, exposure to construction workers can be managed according to the Occupational Safety and Health Administration (OSHA) protocols.
- Trespassers: Trespassers could potentially have short-term (*i.e.*, hours to days) exposure to surface soil via ingestion, dermal contact, and inhalation of particulates. However, an exposure pathway to groundwater is incomplete as no water supply wells are located on-Site. Further, the Site is fenced and locked to prevent trespasser activity. Therefore, even if trespassers did access the Site, no exposure would be anticipated.

5.6.3.2 Off-Site Receptors and Exposure Pathways

5.6.3.2.1 Lead-contaminated Soil

As noted in Section 3.2.1, three soil samples located at or slightly past the Site property/fence line report detection of lead above the RRS. Two of the locations are on the edge of the property line

abutting to the Norfolk Southern right-of-way for active railroad lines and the supporting rail ballast stone. Construction or railroad maintenance workers could potentially have short-term dermal contact exposure to contaminated soil or inhalation of particulates. The other soil sample is located at the edge of 7th Street. No further excavation could be conducted adjacent to 7th Street as excavation would have undermined or required removal of the 7th Street base material or concrete. As with the other two off-Site locations, road maintenance or construction workers could potentially have short-term exposure to lead-contaminated soil through dermal contact or inhalation of particulates.

5.6.3.2.2 Groundwater VOCs

There are no known users of groundwater in the vicinity of the Site and specifically down-gradient of the Site as detailed in the well survey (Section 5.6.2). If required, future potable water needs for this area would be supplied by the City of Macon. Thus, future pathways for exposure to groundwater exclude dermal and ingestion routes and only vapor intrusion is considered a potential possibility.

6 RISK ANALYSIS

6.1 Overview of the Risk Analysis Process

The risk analysis presented in this section of the report builds upon the CSM, potential receptors and exposure pathways presented in Section 5 for the Site COCs. Specifically, the soil risk analysis evaluates the current soil-bound lead exposure potential with respect to the Site-specific non-residential RRS, the groundwater risk analysis is specific to the VOC plume, and the LNAPL risk analysis is specific to the LNAPL concerns and applicable remedial objectives identified in the VIRP and herein, since updated with the Site studies performed to qualify the concerns and determine if further action is warranted.

6.2 Soil Risk Analysis

6.2.1 Soil Dataset

Soil testing data included in the lead risk analysis includes all testing data for soil from 0 to 2 ft-begs obtained during Site assessment activity (1997 through 2011) and soil data obtained during the confirmational sampling performed during the 2011 removal action. A summary of the soil data is provided in Table 6.1.

6.2.2 Potential Exposure Units

Site exposure units evaluated in the soil-bound lead risk analysis account for multiple future land parcel options and the parcel options are provided in Figure 6.1. The options include (1) reuse of the 22-acre Site as a whole, (2) division of the 22-acre Site into halves, and lastly, (3) division of the Site into quarters. In the quarters land parcel option, the size of the land parcels ranges from 3.3 acres to 7.3 acres.

6.2.3 Statistical Analysis

The soil-bound lead risk assessment applied the 95% Upper Confidence Limit on the mean ("95% UCL") as the representative concentration for each exposure unit. The 95% UCL was calculated with the US Environmental Protection Agency ProUCL software, version 5.1. The ProUCL input and output files are included as Appendix J. The nonparametric distribution Chebyshev 95% UCL, the recommended UCL for most datasets, was selected as the suitable output value for comparison to the Site-specific non-residential RRS.

6.2.4 Comparison of Soil Lead 95% UCL to Site-Specific RRS

A summary of the soil-bound lead 95% UCL values for potential future land parcel options is provided below. No land parcel option results in an exceedance of the Site-specific RRS of 1,300 mg/kg.

Summary of Soil Lead Statistical Analysis

Area	#Samples (0-2 ft-bgs)	Mean (mg/kg)	Median (mg/kg)	95% UCL (mg/kg)
Section 1	55	573	323	1,283
Section 2	203	390	265	515
Section 3	270	462	409	564
Section 4	108	347	254	484
Section 1&2	258	429	271	610
Section 3&4	378	429	330	512
All Sections	636	429	313	517

6.2.5 Protection of Groundwater

Assessment of potential leaching of soil-bound lead to groundwater was directly tested from 2009 to 2016 with a finding that soil leaching was not occurring at a detectable level. Furthermore, following the removal action for soil-bound lead, any future potential risk to groundwater has been minimized.

6.3 Groundwater Risk Analysis

6.3.1 Receptor Evaluation

An on-Site pathway for ingestion or dermal exposure to groundwater is incomplete as no water well is located on-Site and historically potable water was provided by the City of Macon. The future on-Site risk to groundwater will be prohibited through the use of a UEC. The UEC will accomplish two risk management objectives with respect to groundwater for the Site. First, the UEC will restrict groundwater withdrawal from the property and second, construction of any enclosed infrastructure will require proper vapor intrusion testing, and, if necessary, mitigation measures to address potential vapor intrusion concerns caused by the groundwater VOC condition (*e.g.*, foundation vapor barrier or sub-slab depressurization).

There are no known off-Site users of groundwater in the vicinity of the Site and specifically down-gradient of the Site. Thus, future pathways for exposure and the risk from groundwater excludes dermal and ingestion routes and only vapor intrusion is considered a potential pathway for exposure. However, the development of occupied structures above the VOC plume is unlikely as

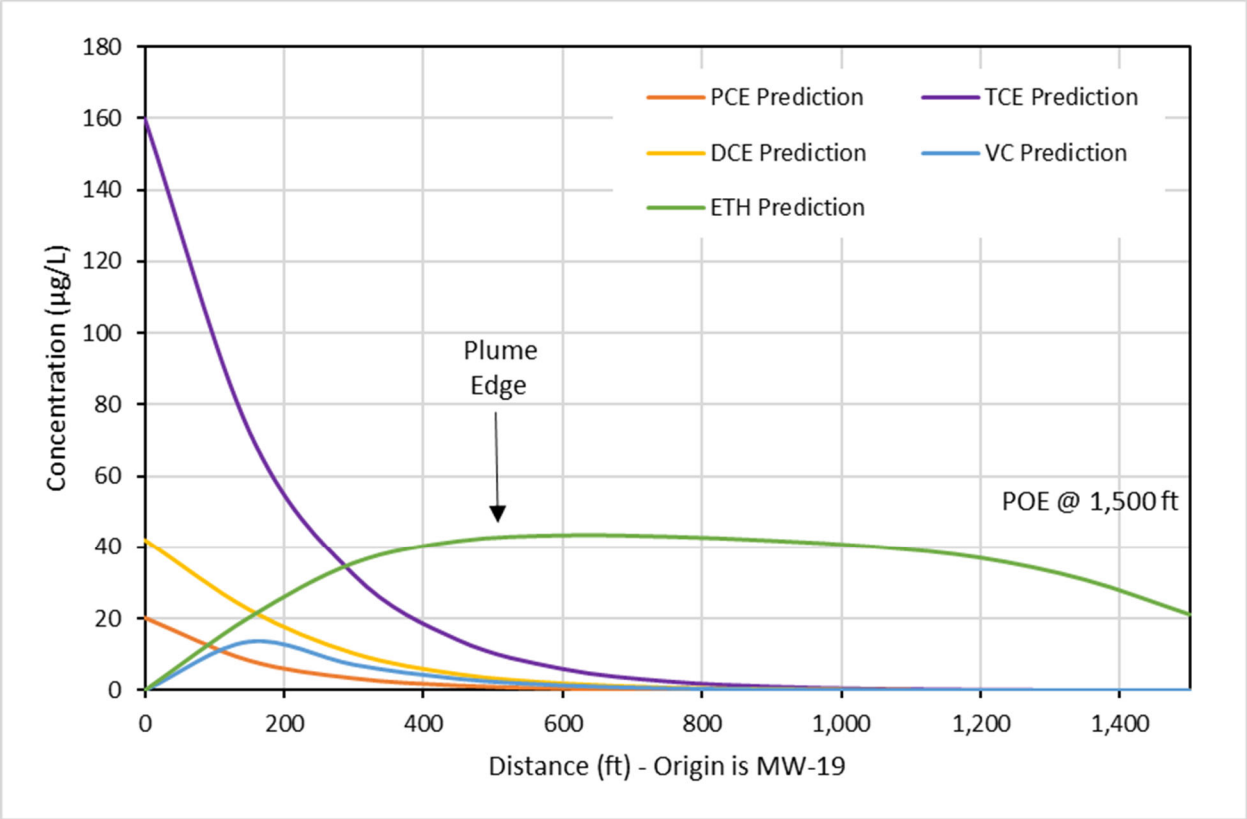
the plume area is currently occupied by several active rail lines and industrial land use features (*i.e.*, roads and material storage) of the Brosnan Rail Yard. Therefore, the risk to off-Site receptors is considered negligible.

6.3.2 Fate and Transport Model

Under the VRP, a downgradient POE is defined as the nearest of the following: the closest existing downgradient drinking water well, the likely nearest future downgradient drinking water well, or at a hypothetical point of exposure 1,000 feet downgradient of the plume edge. No drinking water wells exist within three miles downgradient of the Site (Section 5.6.2) and the groundwater POE is therefore established as a hypothetical POE 1,000 feet downgradient of the plume edge.

The US EPA BIOCHLOR fate and transport model was applied to simulate remediation by natural attenuation and determine if the VOC plume may be a concern for the hypothetical POE. The modeling effort, which is included in Appendix K, applied Site-specific hydrogeologic data from the CSM (Section 5) and VOC data from off-Site wells MW-19, MW-20 and MW-21. MW-19 was selected as the point of origin, as the location exhibits the highest VOC concentration values. The model, following calibration of the biotransformation coefficients, indicates that the groundwater plume constituents will not migrate to the POE, and will not migrate to the POE in the future at concentrations exceeding applicable standards. The results of the BIOCHLOR model are provided below. Note that 1000 feet from the edge of the plume (*i.e.*, the POE) would be located at 1,500 on the x-axis provided below as the model condition originates at MW-19 and the plume edge is located at MW-21, approximately 500 feet down-gradient from MW-19.

Modeled VOC Constituent Profiles to POE



6.4 LNAPL Risk Analysis

6.4.1 LCSM Risk Concerns

Based on the Site LCSM, three potential risk concerns were recognized in the VIRP. In review, the three concerns are as follows.

Concern 1: Presence of LNAPL product in Site monitoring wells, defined as an LNAPL saturation risk concern (*i.e.*, migration concern).

Concern 2: LNAPL as a potential source of soluble or dissolved constituents to groundwater, defined as a dissolved groundwater plume risk concern.

Concern 3: Potential exposure to LNAPL (product or soil) or inhalation of LNAPL vapors in the event the area is disturbed to support future redevelopment, defined as an LNAPL exposure risk concern.

Remedial objectives to address each LNAPL risk concern were summarized in the VIRP with proposed actions or measures to qualify the potential risk of each. The remedial objectives in accordance with each LNAPL risk were presented as follows.

LNAPL Concerns and Remedial Objectives

Concern	Potential Risk	Remedial Objective	Performance Metric
Concern 1: LNAPL Product Saturation	The presence of LNAPL product (*i.e.*, LNAPL saturation) in Site monitoring wells; potential migration	Reduce LNAPL saturation and prevent product migration, NFA approach through land management (*i.e.*, UEC)	Evaluate LNAPL stability & migration potential (*i.e.*, transmissivity); UEC
Concern 2: Dissolved Plume	LNAPL as a potential source of dissolved constituents to groundwater (*i.e.*, dissolve plume)	Attainment of Type 4 RRS for naphthalene (and PAHs) prior to property line/POE	Dissolved plume evaluation; attainment and delineation of naphthalene (and PAHs) to regulatory standard at property line/POE
Concern 3: Direct Contact & Inhalation	Potential exposure to LNAPL (product or soil) or inhalation of LNAPL vapors in the event the area is disturbed to support future redevelopment	Land management (*i.e.*, UEC)	Establish a UEC to manage land use above the LNAPL smear zone

6.4.2 Concern 1: LNAPL Product Saturation

The LNAPL product saturation remedial objective is to attain a state where further migration of LNAPL is inhibited, a condition compatible with but preceding attainment of LNAPL recovery to the MEP. Upon attainment of this objective, the risk to LNAPL exposure can be properly managed as the extent of the LNAPL is defined and the LNAPL will not pose an unforeseen risk to other areas on-Site or Off-Site in the future. Currently, sufficient historical data from nearly two decades of Site assessment work is available to confirm the spatial stability and extent of the LNAPL smear zone and the area of potential risk is defined as presented in the LCSM (Section 5.5).

Furthermore, the LNAPL product recovery efforts performed to date in accordance with the original CAP has advanced the LNAPL product saturation remedial objective through direct removal of the product. Testing performed to evaluate the approach and LNAPL recoverability efforts (*i.e.*, LNAPL transmissivity) affirms migration of LNAPL is inhibited to the point that no further recovery of LNAPL is reasonable for the purpose of further reducing LNAPL migration potential. Thus, the remedial objective with regard to LNAPL product saturation has been achieved.

6.4.3 Concern 2: Dissolved Plume

The second remedial objective for the Site LNAPL is to evaluate the LNAPL smear zone as a potential source of dissolved constituents to groundwater, specifically, naphthalene based on prior testing data, and if present manage the dissolved condition to the Type 4 RRS (20 µg/L) at the property boundary (or a POE if necessary). As detailed in Section 5.5.4, dissolved LNAPL

constituents comprising of PAHs are detected in the monitoring well tested nearest the LNAPL smear zone including naphthalene reported at 0.92 µg/L (less than the RRS). However, monitoring wells tested further down-gradient on-Site and to the side of the LNAPL smear zone are non-detect for all PAHs with a single exception for pyrene in TW-08. Thus, the dissolved plume concern is limited to potential on-Site receptors only and since Site groundwater is not withdrawn for any purpose, the exposure pathway to on-Site receptors is incomplete and the remedial objective has been attained.

6.4.4 Concern 3: Direct Contact & Inhalation

The third remedial objective for the Site LNAPL is to prevent direct receptor contact with the LNAPL smear zone or secondary contact through a route of vapor intrusion. Both exposure routes are limited to on-Site receptors and only under a scenario where the LNAPL smear zone is actively disturbed or excavated, or in the case of vapor intrusion, an enclosed structure is built over the LNAPL area. Therefore, the LNAPL smear zone area will be appropriately managed through a UEC. A UEC will prevent future incidental contact and allow for appropriate health and safety measures to be enacted if the area were to be disturbed during future Site redevelopment, or require proper vapor intrusion testing, and if necessary, mitigation measures to address potential vapor intrusion concerns (*e.g.*, foundation vapor barrier or sub-slab depressurization).

7 SITE COMPLIANCE

7.1 Soil Delineation and Compliance

Delineation of soil-bound lead to the residential RRS is complete based on off-Site soil samples collected beyond the property edge. The soil is also in compliance with the Site-specific non-residential RRS based on the analysis of future exposure unit or land parcel options (Section 6.2). Furthermore, property use at the Site will be limited to non-residential use based on the proposed UEC.

7.2 Groundwater Delineation and Compliance

7.2.1 Groundwater Delineation

Horizontal and vertical groundwater delineation has been demonstrated in previous reports and was reviewed herein. Groundwater use limitations for the Site will be established in the proposed UEC. This Site did not historically list on the Hazardous Site Inventory for groundwater, and, based on the water well survey (Appendix I), it would not currently list as a result of a release to groundwater exceeding a reportable quantity. For this reason, compliance certification for groundwater is not required.

7.2.2 Points of Demonstration and Exposure

Under the VRP, the Point of Demonstration (POD) is a monitoring well located between the source of the Site groundwater impacts and the actual or estimated downgradient POE, which is defined as a hypothetical point of exposure 1,000 feet downgradient of the plume edge. No drinking water wells exist within three miles downgradient of the Site. The POD is proposed to be monitoring well MW-21, and the groundwater POE has been established as a hypothetical point of exposure 1,000 feet downgradient of the plume edge (Figure 7.1).

7.3 LNAPL Remedial Objective Compliance

The three LNAPL remedial objectives have been achieved. Specifically, (1) the LNAPL product condition is stable and defined and will not pose a risk to potential off-Site receptors, (2) the LNAPL is a minor source of dissolved constituents to groundwater and the plume of dissolved constituents was delineated to a marginal area down-gradient of the LNAPL smear zone and furthermore, the dissolved constituents are limited to on-Site groundwater which lacks a pathway for exposure to future potential receptors, and lastly, (3) the proposed UEC will manage future risk

and allow for appropriate health and safety measures to be enacted if the area where the residual LNAPL smear zone exists were to be disturbed during future Site redevelopment.

8 REFERENCES

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FIGURES

Figure 1.1
Site Location

Former Transco Railcar Facility
Macon, Georgia

Figure Narrative

Figure depicts the location of the Site in Macon, GA. The Ocmulgee River is located approximately 4000 ft to the north and east of the Site.

Notes

Physical Address:
861 7th Street
Macon, Georgia

Legend

Site

N
W E
S

0 1,000 2,000
Feet

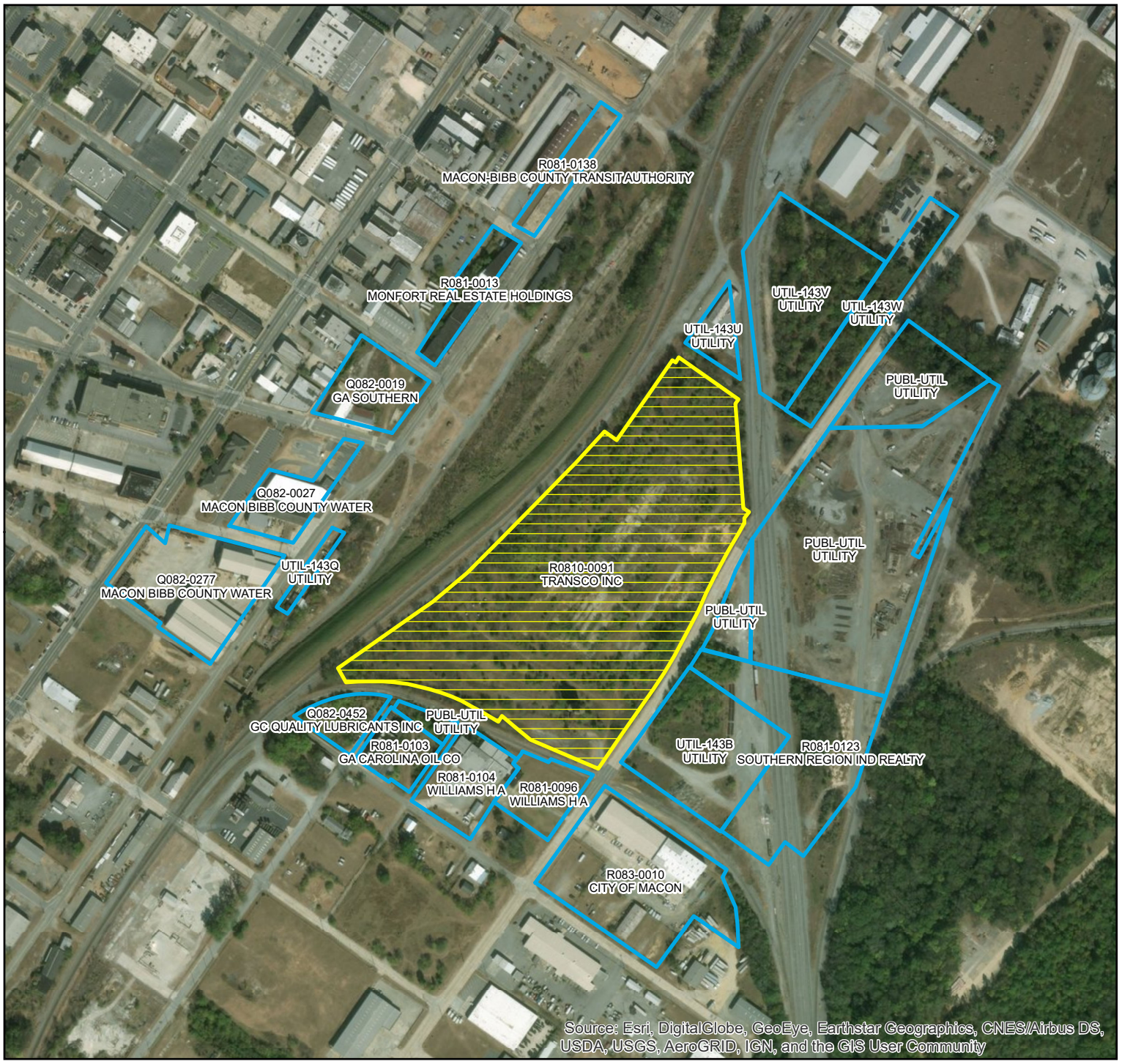

Figure 1.2
Site and Adjacent Properties

Former Transco Railcar Facility
Macon, Georgia

Figure Narrative

Figure depicts the location of the Site, adjacent land parcels, parcel owner and Parcel ID. Note that several parcels are identifed at Public Utility (PUBL-UTIL) land.

Notes

Parcel information obtained from the Bibb Country, Georgia Board ofTax Assessors.
(accessed August 17, 2017)

Legend

Off-Site Parcel

Site

N
W E
S

0 250 500
Feet

Figure 1.3
Site Features
(Former and Current)

Former Transco Railcar Facility
Macon, Georgia

Figure Narrative
Figure depicts the current and former Site features.

Notes
Physical Address:
861 7th Street
Macon, Georgia

Legend
- Site
- Site Fence

N
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0 125 250
Feet

Environmental Planning Specialists, Inc.

Figure 3.1
Groundwater Monitoring Network

Former Transco Railcar Facility
Macon, Georgia

Figure Narrative

Figure depicts the locations of groundwater monitoring wells (MW) and temporary wells (TW).

Notes

Legend

- Site
- Monitoring Well
- Temporary Well

N
W E
S

0 150 300
Feet

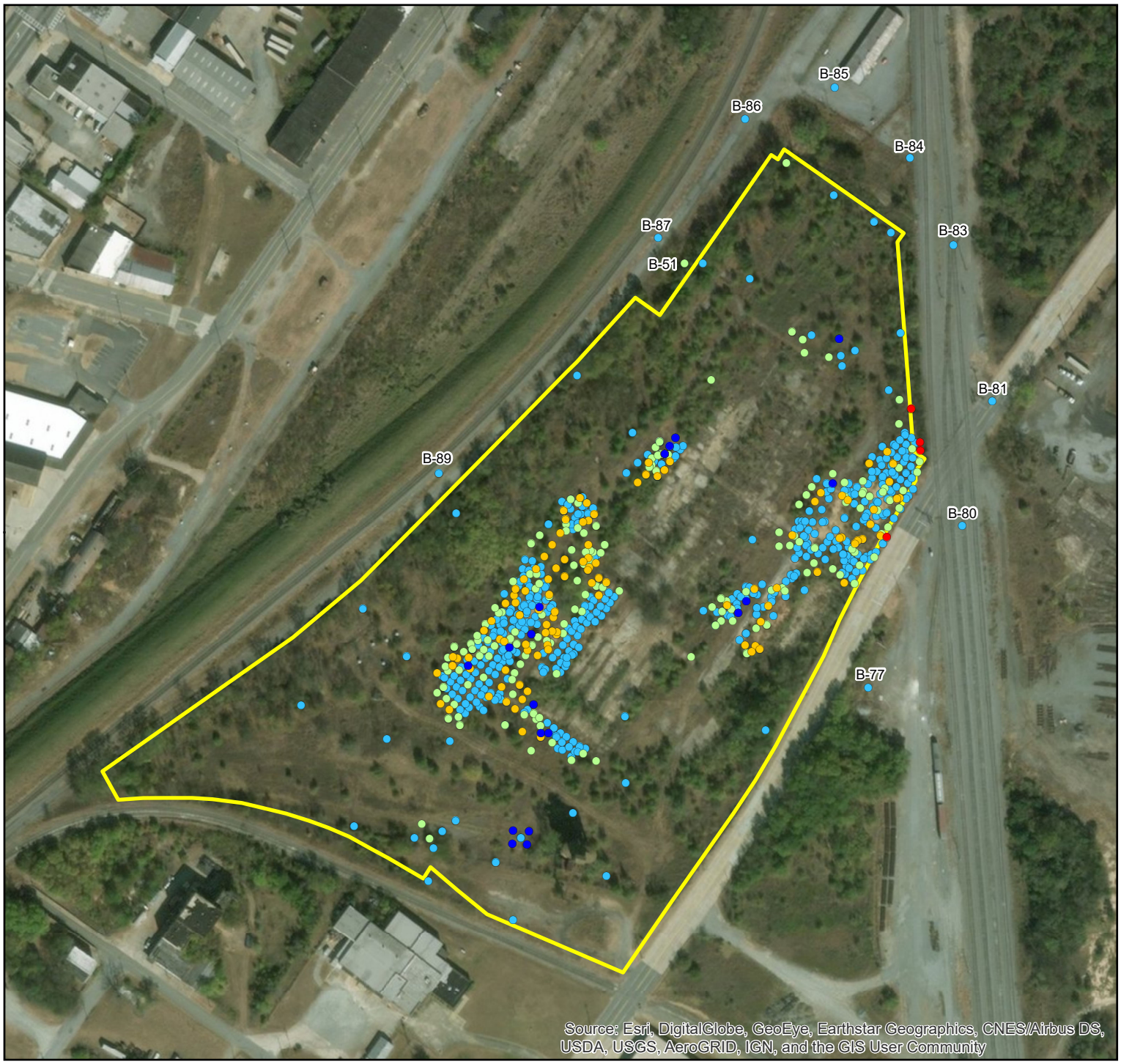

Figure 3.2
Soil-bound Lead Delineation

Former Transco Railcar Facility
Macon, Georgia

Figure Narrative

Figure depicts the existing soil lead condition with respect to the Site-specific RRS.

Notes

Location ID provided for off-Site sample locations (see Table 6.1)

Lead RRS = 1,300 mg/kg
(for soil 0-2 ft-bgs)

Legend

- Site

Soil Lead (0 to 2 ft-bgs)

- ND
- < 400 (Res RRS)
- 400 - 800
- 800 - 1,300
- > 1,300 (non-Res RRS)

N
W E
S

0 125 250
Feet

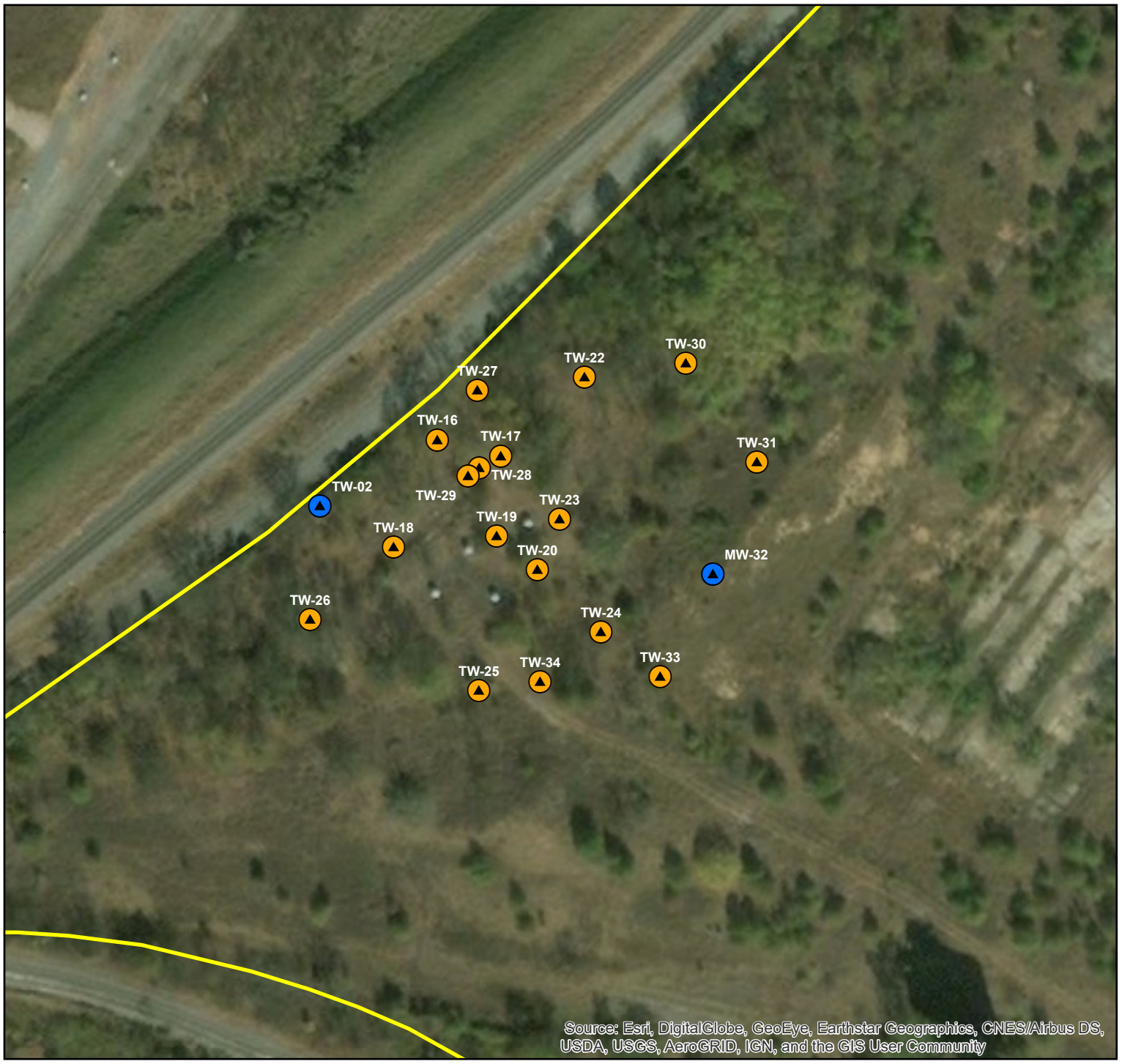

Figure 3.3
LNAPL Investigation & Delineation Wells

Former Transco Railcar Facility
Macon, Georgia

Figure Narrative

Figure depicts the locations of well points installed to investigate the LNAPL smear zone.

Notes

Legend

- Site
- Monitoring Well
- Temporary Well

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0 50 100
Feet

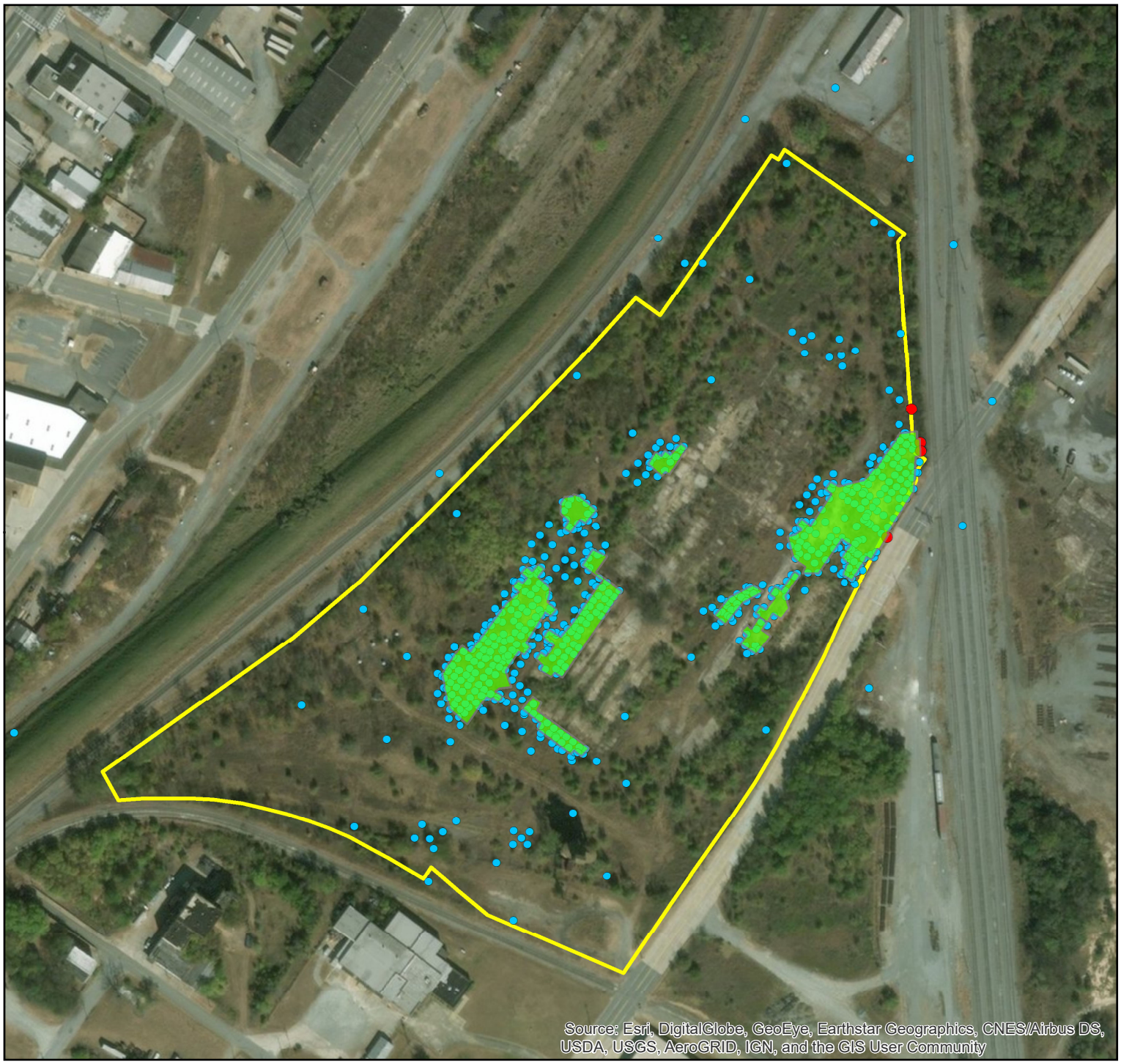


Figure 3.4
Existing Soil-bound Lead Condition & Soil Removal Areas

Former Transco Railcar Facility
Macon, Georgia

Figure Narrative
Figure depicts the existing soil lead condition with respect to the Site-specific RRS and soil removal action areas.

Notes
Lead RRS = 1,300 mg/kg
(for soil 0-2 ft-bgs)

Legend
- Site
- Soil Removal Area
- < RRS (1,300 mg/kg)
- > RRS

N
W E
S

0 125 250
Feet

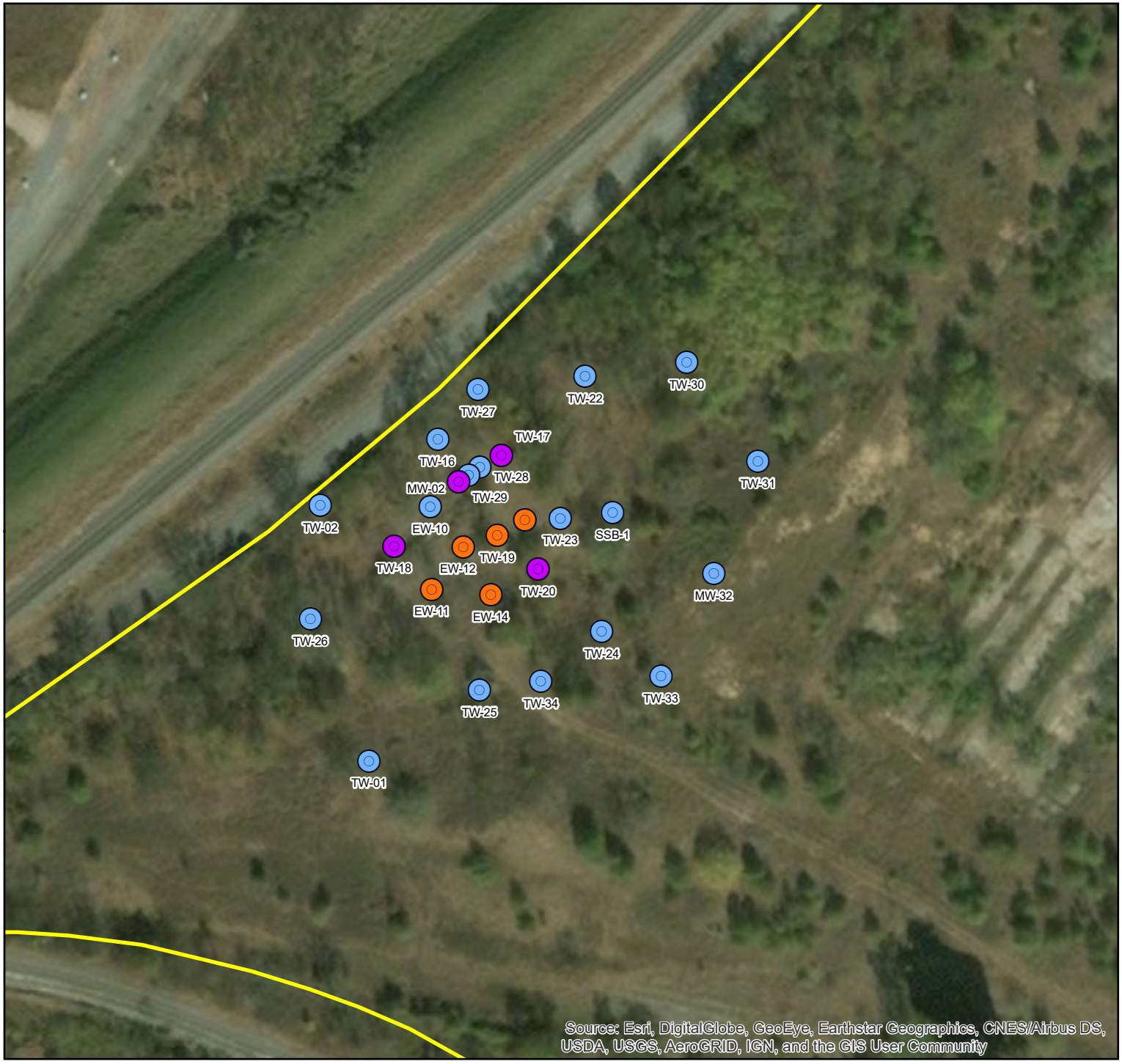


Figure 3.5
LNAPL Product Recovery System and Delineation Wells

Former Transco Railcar Facility
Macon, Georgia

Figure Narrative
Figure depicts the location of LNAPL recovery equipment.

Notes
The hydrophobic belt skimmer units were decommissioned in 2010 and the skimmer pump units were decommissioned in 2013. Units decommissioned based on minimal or no recovery of LNAPL product.

Legend

Site

LNAPL Recovery Method

- 2008-2010: LNAPL Skimmer Hydrophobic Belt
  2010-2016:Manual Recovery
- 2008-2013: LNAPL Skimmer Pump
  2013-2016: Manual Recovery
- 2008-2016: Manual Recovery

N
W E
S

0 50 100
Feet

Figure 3.6
Groundwater Lead Monitoring Program

Former Transco Railcar Facility
Macon, Georgia

Figure Narrative
Figure depicts the 2011 soil removal areas and monitoring wells in the soil-bound lead leaching monitoring program.

Notes

Legend
- Site
- 2011 Soil Removal Area
- Lead Monitrong Well

N
W E
S

0 125 250
Feet

Environmental Planning Specialists, Inc.

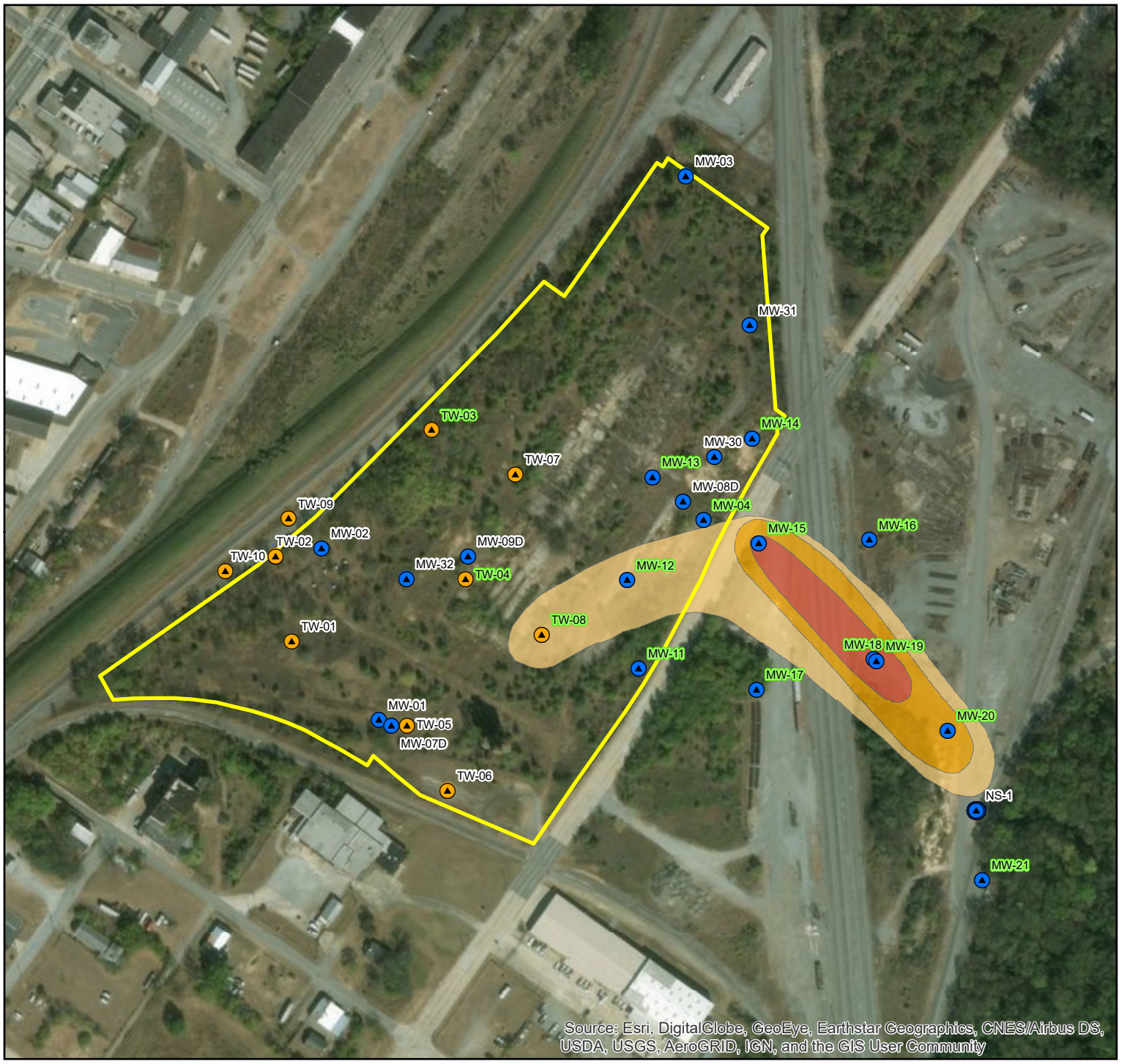


Figure 3.7
Groundwater VOC Monitoring Program

Former Transco Railcar Facility
Macon, Georgia

Figure Narrative
Figure depicts the groundwater VOC plume and Site wells. Monitoring wells outside of plume depiction are non-detect for chloroethenes.

Notes
Well locations included in the CAP MNA program are highlighted green (sampled from 2009 - 2016).

Legend

- Site
- Monitoring Well
- Temporary Well

VOC Plume Profile

- Parent/daughter VOC compounds: plume core
- Parent/daughter VOC compounds: intermediate plume
- Daughter VOC products: plume fringe

N
W E
S

0 150 300
Feet

Figure 5.1
Groundwater Potentiometric Surface (August 2016)

Former Transco Railcar Facility
Macon, Georgia

Figure Narrative

Figure depicts groundwater potentiometric surface lines and inferred groundwater flow path.

Notes

Groundwater elevation measured on August 9-10, 2016.

Legend

- Site
- Monitoring Well
- Groundwater Flow Line
- Potentiometric Line

N
W E
S

0 125 250
Feet

Figure 5.2a

LNAPL Product Frequency of Detection (2008 - 2016)

Former Transco Railcar Facility

Macon, Georgia

Figure Narrative

Figure depicts the frequency of detection of LNAPL product in well casings. A detection represents a measurement of product with an interface probe.

Notes

Legend

Site

LNAPL Freqency of Detection

- Non-detect
- < 25%
- 26% - 50%
- 51% -75%
- 76% - 99%
- 100%

N

W E

S

0 30 60

Feet

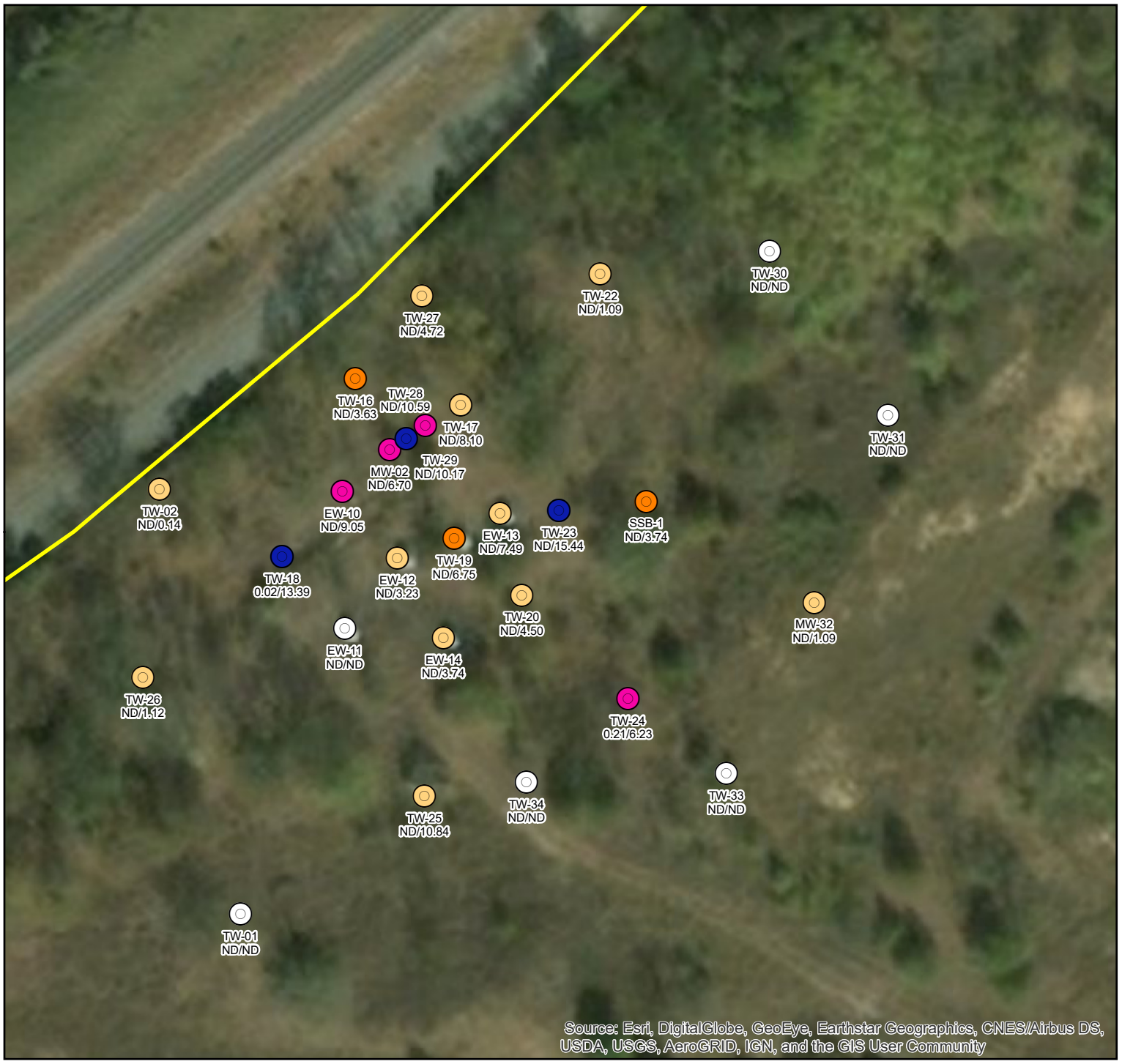


Figure 5.2b

LNAPL Product Thickness Measurements (2008 - 2016)

Former Transco Railcar Facility

Macon, Georgia

Figure Narrative

Figure depicts the average LNAPL product thickness, the minimum product thickness and the maximum product thickness from 2008 to 2016.

Notes

LNAPL Units: feet
ND: Non-detect

Legend

Site

Average LNAPL Thickess

- Non-detect
- < 1 ft
- 1 - 2 ft
- 2 - 3 ft
- 3 - 4 ft
- 4 - 6 ft

Well ID
Minimum LNAPL/Maximum LNAPL

N
W E
S

0 30 60
Feet

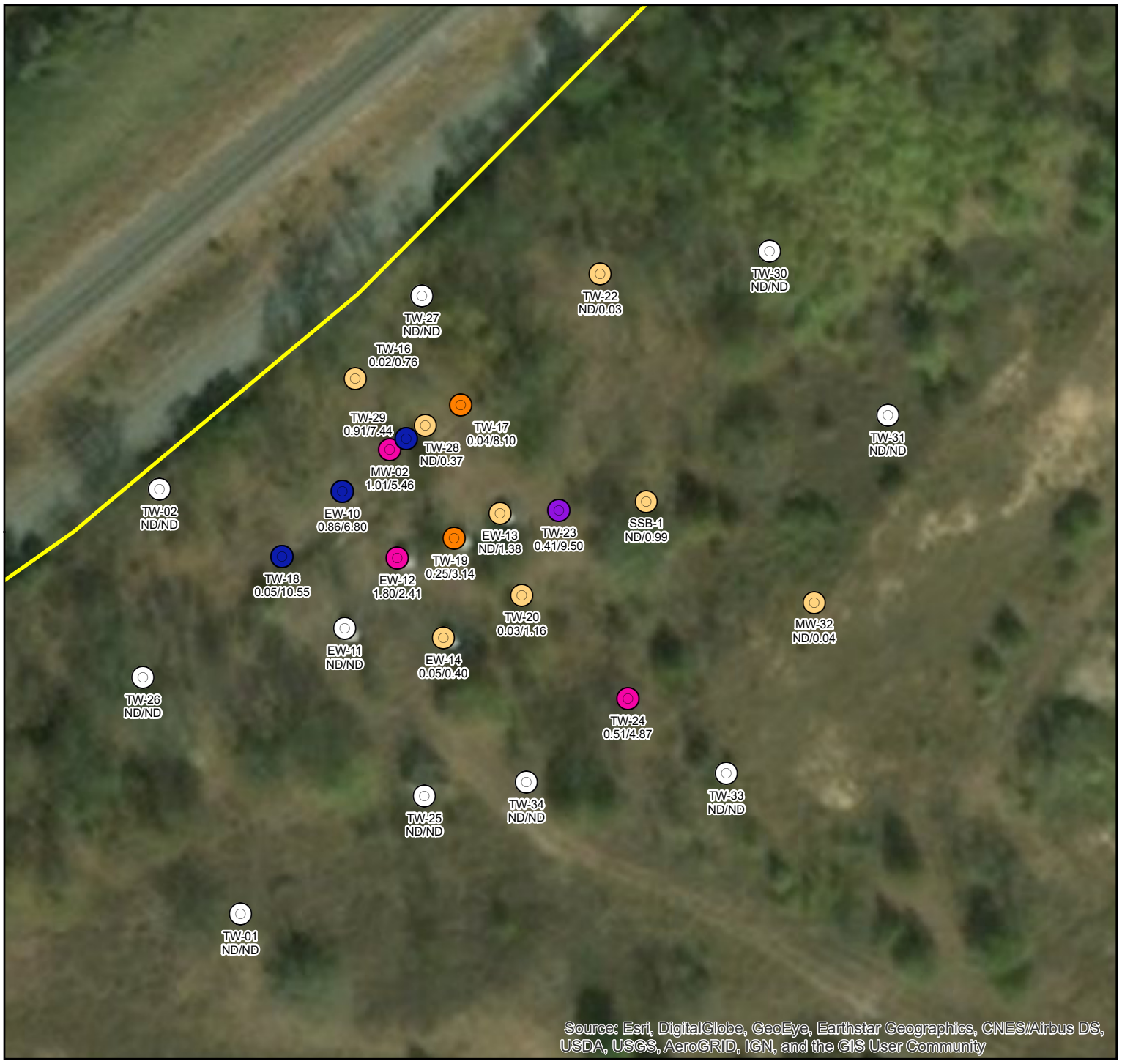


Figure 5.2c

LNAPL Product Thickness Measurements (2014 - 2016)

Former Transco Railcar Facility

Macon, Georgia

Figure Narrative

Figure depicts the average LNAPL product thickness, the minimum product thickness and the maximum product thickness from 2008 to 2016.

Notes

LNAPL Units: feet
ND: Non-detect

Legend

Site

Average LNAPL Thickess

- Non-detect
- < 1 ft
- 1 - 2 ft
- 2 - 3 ft
- 3 - 4 ft
- 4 - 6 ft

Well ID
Minimum LNAPL/Maximum LNAPL

N
W E
S

0 30 60
Feet

Figure 5.3
Groundwater PAH Assessment Locations

Former Transco Railcar Facility
Macon, Georgia

Figure Narrative
Figure depicts the sample locations for PAH testing with respect to the average LNAPL product thickness from 2014 to 2016.

Notes

Legend

- Site
- PAH Testing

Average LNAPL Thickess

- Non-detect
- < 1 ft
- 1 - 2 ft
- 2 - 3 ft
- 3 - 4 ft
- 4 - 6 ft

N
W E
S

0 60 120
Feet

Summary of Soil Lead Statistical Analysis

Area	Samples (0-2 ft-bgs)	Mean (mg/kg)	Median (mg/kg)	95% UCL (mg/kg)
Section 1	55	573	323	1,283
Section 2	203	390	265	515
Section 3	270	462	409	564
Section 4	108	347	254	484
Section 1&2	258	429	271	610
Section 3&4	378	429	330	512
All Sections	636	429	313	517

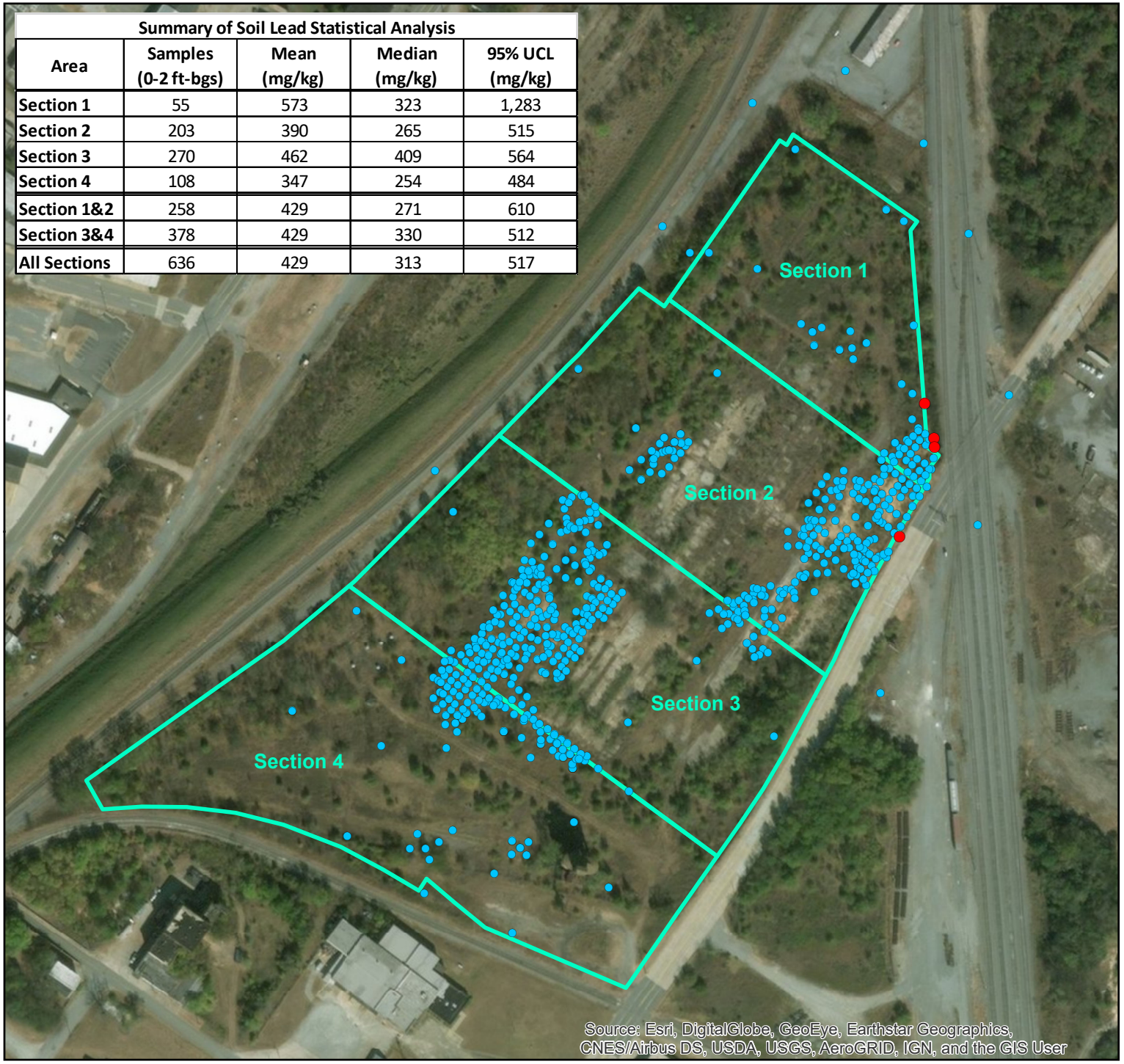


Figure 6.1

Site Exposure Units and Soil Lead Statistics

Former Transco Railcar Facility

Macon, Georgia

Figure Narrative

Figure depicts the existing soil lead condition with respect to the Site-specific RRS and potential future land parcel options.

Notes

Lead RRS = 1,300 mg/kg
(for soil 0-2 ft-bgs)

Legend

- Land Parcel Sections
- < RRS (1,300 mg/kg)
- > RRS

Section Area (acres)

Section 1: 3.3
Section 2: 5.3
Section 3: 6.2
Section 4: 7.3

N
W E
S

0 120 240
Feet

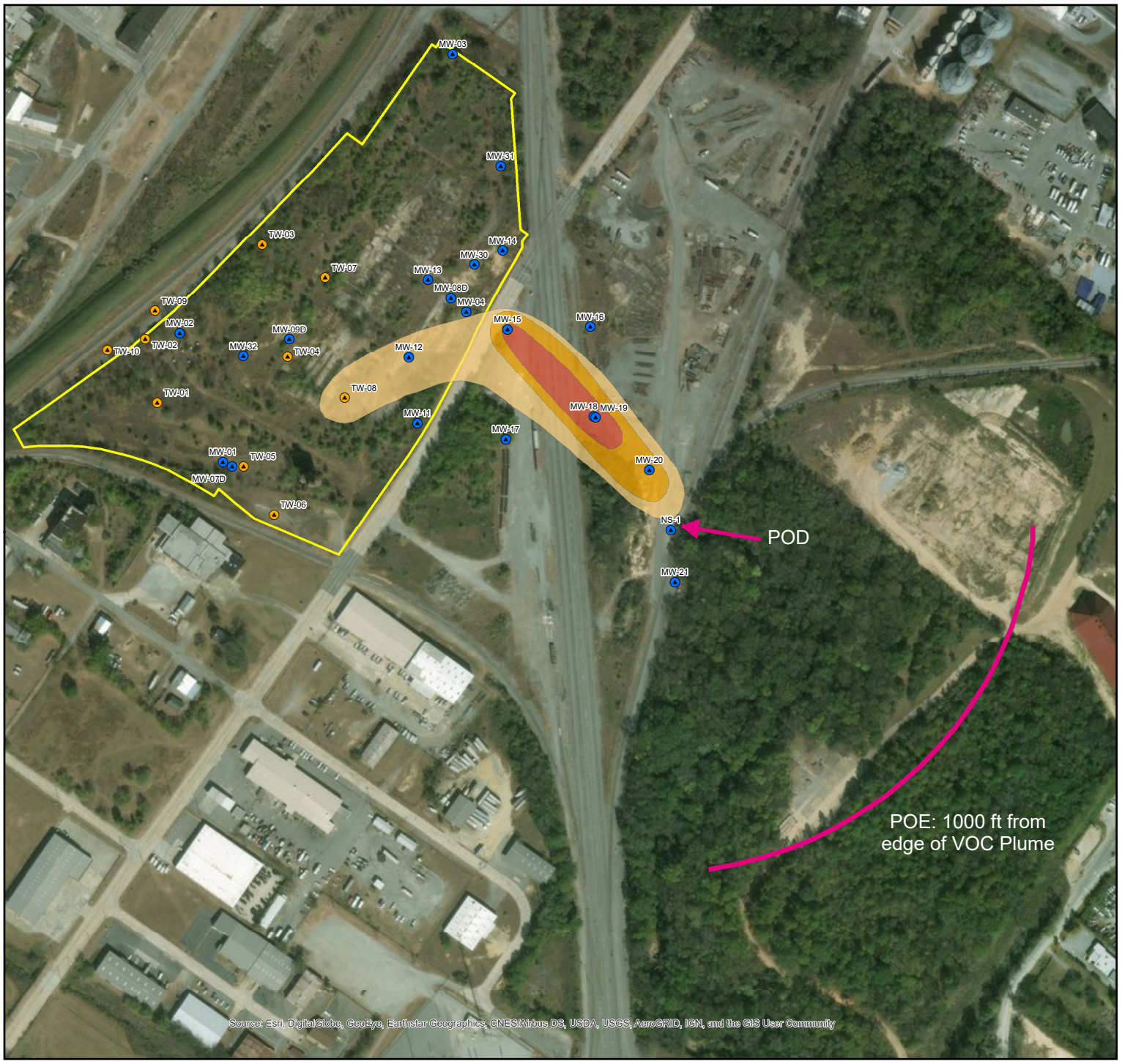


Figure 7.1
Groundwater POD and POE

Former Transco Railcar Facility
Macon, Georgia

Figure Narrative

Figure depicts the VOC groundwater plume, POD well NS-1, and 1000 ft POE area.

Notes

Legend

- Site
- 1000 ft POE Arc
- Monitoring Well
- Temporary Well

VOC Plume Profile

- Parent/daughter VOC compounds: plume core
- Parent/daughter VOC compounds: intermediate plume
- Daughter VOC products: plume fringe

N
W E
S

0 200 400
Feet

TABLES

Table 3.1
Well Construction Details

Location	TOC	Ground Elevation	Total Depth	Total Depth	Screen Interval		Screen Depth
	ft	ft	ft-bgs	ft-BTOC	top: ft-bgs	bottom: ft-bgs	ft BTOC
Groundwater Montioring Wells							
MW-01	102.57	99.57	17.55	20.55	7.55	17.55	10.55 - 20.55
MW-02	105.40	102.40	19.81	22.81	9.81	19.81	12.81 - 22.81
MW-03	102.30	99.30	34.97	37.97	24.97	34.97	27.97 - 37.97
MW-04	95.13	92.13	14.28	17.28	4.28	14.28	7.28 - 17.28
MW-07D	102.64	99.64	65.45	68.45	55.45	65.45	58.05 - 68.05
MW-08D	102.32	99.32	71.68	74.68	61.68	71.68	64.28 - 74.28
MW-09D	102.09	99.09	59.50	62.50	49.50	59.50	52.10 - 62.10
MW-11	94.68	91.68	29.07	32.07	19.07	29.07	22.07 - 32.07
MW-12	102.38	99.38	34.32	37.32	24.32	34.32	27.32 - 37.32
MW-13	102.36	99.36	30.32	33.32	20.32	30.32	23.32 - 33.32
MW-14	101.96	98.96	29.99	32.99	19.99	29.99	22.99 - 32.99
MW-15	93.15	90.15	25.46	28.46	15.46	25.46	18.46 - 28.46
MW-16	87.24	84.24	42.00	45.00	32.00	42.00	35.00 - 45.00
MW-17	88.32	85.32	25.00	28.00	15.00	25.00	18.00 - 28.00
MW-18*	--	--	75.00	78.90	65.00	75.00	67.9 - 78.9
MW-19*	--	--	22.00	25.37	12.00	22.00	15.37 - 25.37
MW-20*	--	--	22.00	25.52	12.00	22.00	15.52 - 25.52
MW-21*	--	--	25.00	28.32	15.00	25.00	18.32 - 28.32
MW-32*	--	--	25.00	27.00	15.00	25.00	17.00 - 27.00
TW-01	103.24	100.24	18.09	21.09	8.09	18.09	11.09 - 21.09
TW-02	104.90	101.90	13.57	16.57	3.57	13.57	6.57 - 16.57
TW-03	100.41	97.41	14.77	17.77	4.77	14.77	7.77 - 17.77
TW-04	101.52	98.52	16.04	19.04	6.04	16.04	9.04 - 19.04
TW-05	101.49	98.49	16.93	19.93	6.93	16.93	9.93 - 19.93
TW-06	99.46	96.46	15.97	18.97	5.97	15,97	8.97 - 18.97
TW-07	106.11	103.11	23.88	26.88	13.88	23.88	16.88 - 26.88
TW-08	101.18	98.18	19.94	22.94	9.94	19.94	12.94 - 22.94
TW-09	108.40	105.40	23.94	26.94	13.94	23.94	16.94 - 26.94
TW-10	108.47	105.47	20.53	23.53	10.53	20.53	13.53 - 23.53
LNAPL Monitoring & Assesment Wells							
TW-16	104.75	101.75	21.76	24.76	6.76	21.76	9.76 - 24.76
TW-17	105.13	102.13	21.83	24.83	6.83	21.83	9.83 - 24.83
TW-18	105.36	102.36	21.79	24.79	6.79	21.79	9.79 - 24.79
TW-19	103.57	100.57	21.89	24.89	6.89	21.89	9.89 - 24.89
TW-20	102.90	99.90	21.75	24.75	6.75	21.75	9.75 - 24.75
TW-21	90.55	87.55	19.18	22.18	4.18	19.18	7.18 - 22.18
TW-22	91.48	88.48	19.15	22.15	4.15	19.15	7.15 - 22.15
TW-23	89.90	86.90	19.06	22.06	4.06	19.06	7.06 -22.06
TW-24	90.68	87.68	19.16	22.16	4.16	19.16	7.16 - 22.16
TW-25	91.21	88.21	19.14	22.14	4.14	19.14	7.14 - 22.14
TW-26	93.29	90.29	19.19	22.19	4.19	19.19	7.19 - 22.19
TW-27	91.78	88.78	19.25	22.25	4.25	19.25	7.25 - 22.25
TW-28	92.57	89.57	19.17	22.17	4.17	19.17	7.17 - 22.17
TW-29	92.36	89.36	19.11	22.11	4.11	19.11	7.11 - 22.11
TW-30*	--	--	25.00	--	5.00	25.00	--
TW-31*	--	--	25.00	--	5.00	25.00	--
TW-32*	--	--	25.00	--	5.00	25.00	--
TW-33*	--	--	25.00	--	5.00	25.00	--
TW-34*	--	--	25.00	--	5.00	25.00	--

ft: feet

* Estimated value

ft-bgs: feet below groundwater surface

--: Information unavailable

TOC: Top of casing

Table 3.2
Time Series Data for Detected VOCs in Groundwater

Location/Date	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Acenaphthene	Acetone	Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Fluorene	Freon-11	Isopropylbenzene	Naphthalene	Phenanthrene	Tetrachloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
Site-Specific RRS:														**20**				**7.2**	**3.2**
MW-01																			
8/6/1997	ND	ND	ND	ND	--	--	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4/13/1999	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2/29/2000	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2/7/2003	ND	ND	ND	--	ND	ND	ND	ND	--	ND	--	ND	ND	ND	--	ND	ND	ND	ND
MW-02																			
8/6/1997	ND	ND	ND	ND	--	--	ND	ND	--	ND	ND	ND	12.1	76.5	106	ND	ND	ND	ND
4/13/1999	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	1200	ND	ND	ND	1700	ND	ND	ND	ND
10/6/2000	--	--	--	5	--	--	--	--	--	--	7	--	--	ND	5	--	--	--	--
MW-03																			
8/13/1997	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4/13/1999	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2/29/2000	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2/7/2003	ND	ND	ND	--	ND	ND	ND	ND	--	ND	--	ND	ND	ND	--	ND	ND	ND	ND
MW-04																			
8/13/1997	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	3	ND
4/13/1999	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	5	ND
3/1/2000	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	6	ND
10/1/2002	--	--	--	--	ND	ND	ND	ND	--	ND	--	--	--	--	--	ND	ND	1.7	ND
1/14/2003	ND	ND	ND	--	ND	ND	ND	ND	--	ND	--	ND	ND	1.1	--	ND	ND	ND	ND
3/1/2007	ND	ND	ND	--	ND	ND	ND	ND	--	ND	--	ND	ND	ND	--	ND	ND	ND	ND
8/21/2009	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
11/16/2009	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
2/18/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
5/5/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/11/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
11/29/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
2/23/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
5/9/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/2/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
7/25/2012	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
9/17/2013	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
9/11/2014	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/5/2015	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/10/2016	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
MW-08D																			
6/28/2000	ND	ND	ND	--	29.5	2.6	ND	ND	--	ND	--	ND	ND	ND	--	ND	ND	2.8	ND
10/6/2000	ND	ND	ND	--	ND	ND	ND	ND	--	ND	--	ND	ND	ND	--	ND	ND	ND	ND
2/7/2003	ND	ND	ND	--	ND	ND	ND	ND	--	ND	--	ND	ND	ND	--	ND	ND	ND	ND

Units: µg/L
ND: Non-detect
--: not measured

Table 3.2
Time Series Data for Detected VOCs in Groundwater

Location/Date	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Acenaphthene	Acetone	Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Fluorene	Freon-11	Isopropylbenzene	Naphthalene	Phenanthrene	Tetrachloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
MW-11																			
10/5/2000	ND	ND	ND	--	ND	ND	ND	ND	--	ND	--	ND	2.2	ND	--	ND	ND	ND	ND
10/1/2002	--	--	--	--	ND	ND	ND	ND	--	ND	--	--	--	--	--	ND	ND	ND	ND
1/14/2003	ND	ND	ND	--	ND	ND	ND	ND	--	ND	--	ND	ND	ND	--	ND	ND	2.3	ND
3/1/2007	ND	ND	ND	--	ND	ND	ND	ND	--	ND	--	ND	ND	ND	--	ND	ND	ND	ND
8/21/2009	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
11/16/2009	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
2/18/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
5/5/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/11/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
11/29/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
2/23/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
5/9/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/2/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
7/25/2012	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
9/18/2013	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
9/11/2014	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/5/2015	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/10/2016	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
MW-12																			
10/5/2000	ND	ND	ND	--	ND	ND	ND	ND	--	6.8	--	ND	ND	ND	--	ND	ND	26.6	ND
10/1/2002	--	--	--	--	ND	ND	ND	7.2	--	36	--	--	--	--	--	29	3.9	140	4.6
1/14/2003	ND	ND	ND	--	ND	ND	ND	ND	--	7	--	ND	ND	ND	--	ND	1.9	9.4	ND
3/1/2007	ND	ND	ND	--	ND	ND	ND	ND	--	9.7	--	ND	ND	ND	--	ND	ND	8.3	ND
8/21/2009	ND	ND	ND	--	ND	ND	ND	ND	ND	16	--	ND	ND	--	--	ND	ND	19	ND
11/16/2009	ND	ND	ND	--	ND	ND	ND	ND	ND	6.6	--	ND	ND	--	--	ND	ND	7.5	ND
2/18/2010	ND	ND	ND	--	ND	ND	ND	14	ND	9.9	--	ND	ND	--	--	ND	ND	6.6	ND
5/5/2010	ND	ND	ND	--	ND	ND	ND	9.7	ND	12	--	ND	ND	--	--	ND	ND	10	ND
8/11/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	12	--	ND	ND	--	--	ND	ND	18	ND
11/29/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	14	--	ND	ND	--	--	ND	ND	20	ND
2/22/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	5.9	--	ND	ND	--	--	ND	ND	9.8	ND
5/9/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	9.8	--	ND	ND	--	--	ND	ND	10	ND
8/2/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	15	--	ND	ND	--	--	ND	ND	18	ND
7/25/2012	ND	ND	ND	--	ND	ND	ND	ND	ND	15	--	ND	ND	--	--	ND	5.5	17	ND
9/17/2013	ND	ND	ND	--	ND	ND	ND	69	ND	9.4	--	ND	ND	--	--	ND	ND	6.3	ND
9/11/2014	ND	ND	ND	--	ND	ND	ND	ND	ND	12	--	ND	ND	--	--	ND	ND	11	ND
8/5/2015	ND	ND	ND	--	ND	ND	ND	ND	ND	13	--	ND	ND	--	--	ND	ND	13	ND
8/10/2016	ND	ND	ND	--	ND	ND	ND	ND	ND	19	--	ND	ND	--	--	ND	5.2	17	ND

Units: µg/L
ND: Non-detect
--: not measured

Table 3.2
Time Series Data for Detected VOCs in Groundwater

Location/Date	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Acenaphthene	Acetone	Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Fluorene	Freon-11	Isopropylbenzene	Naphthalene	Phenanthrene	Tetrachloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
MW-13																			
10/5/2000	ND	ND	ND	--	ND	ND	ND	ND	--	ND	--	ND	ND	ND	--	ND	ND	ND	ND
10/1/2002	--	--	--	--	ND	ND	ND	ND	--	ND	--	--	--	--	--	ND	ND	ND	ND
1/14/2003	ND	ND	ND	--	ND	ND	ND	ND	--	ND	--	ND	ND	ND	--	ND	ND	1.3	ND
3/1/2007	ND	ND	ND	--	ND	ND	ND	ND	--	ND	--	ND	ND	ND	--	ND	ND	ND	ND
8/21/2009	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
11/16/2009	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
2/18/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
5/5/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/11/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
11/29/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
2/22/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
5/10/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/2/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
7/24/2012	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
9/17/2013	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
9/11/2014	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/5/2015	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/10/2016	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
MW-14																			
10/5/2000	ND	ND	ND	--	ND	ND	10.8	ND	--	ND	--	ND	ND	ND	--	ND	ND	12.5	ND
10/1/2002	--	--	--	--	ND	ND	43	ND	--	1.1	--	--	--	--	--	ND	ND	6.5	ND
1/15/2003	ND	ND	ND	--	ND	ND	ND	ND	--	ND	--	ND	ND	ND	--	ND	ND	2.3	ND
2/28/2007	ND	ND	ND	--	ND	ND	ND	ND	--	ND	--	ND	ND	ND	--	ND	ND	ND	ND
8/21/2009	ND	ND	ND	--	ND	ND	19	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
11/16/2009	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
2/19/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
5/5/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	5.7	ND
8/11/2010	ND	ND	ND	--	ND	ND	12	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
11/30/2010	ND	ND	ND	--	ND	ND	28	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
2/22/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
5/10/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/2/2011	ND	ND	ND	--	ND	ND	26	ND	5.5	ND	--	ND	ND	--	--	ND	ND	ND	ND
7/24/2012	ND	ND	ND	--	ND	ND	23	ND	5.3	ND	--	ND	ND	--	--	ND	ND	ND	ND
9/17/2013	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
9/10/2014	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/5/2015	ND	ND	ND	--	ND	ND	13	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/10/2016	ND	ND	ND	--	ND	ND	6	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND

Units: µg/L
ND: Non-detect
--: not measured

Table 3.2
Time Series Data for Detected VOCs in Groundwater

Location/Date	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Acenaphthene	Acetone	Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Fluorene	Freon-11	Isopropylbenzene	Naphthalene	Phenanthrene	Tetrachloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
MW-15																			
10/5/2000	18.9	2.7	6.4	--	ND	ND	ND	20.3	--	87.1	--	ND	ND	ND	--	55.8	3.2	165	10.8
10/1/2002	--	--	--	--	ND	ND	ND	7.3	--	39	--	--	--	--	--	27	4.1	140	4.6
1/14/2003	2.8	ND	1	--	ND	ND	ND	3	--	34	--	ND	ND	ND	--	16	3.6	140	3.5
2/28/2007	ND	ND	ND	--	ND	ND	ND	ND	--	70	--	ND	ND	ND	--	23	5.9	210	8.4
8/20/2009	7.8	ND	ND	--	ND	ND	ND	6	ND	41	--	ND	ND	--	--	26	ND	130	4
11/16/2009	9	ND	ND	--	ND	ND	ND	6.8	ND	41	--	ND	ND	--	--	29	5.2	170	5
2/18/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	32	--	ND	ND	--	--	18	5.8	190	3.5
5/5/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	37	--	ND	ND	--	--	23	5.1	180	3.8
8/11/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	21	--	ND	ND	--	--	13	ND	110	2.5
11/29/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	18	--	ND	ND	--	--	16	ND	110	2
2/22/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	29	--	ND	ND	--	--	16	ND	130	2.5
5/10/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	36	--	ND	ND	--	--	16	ND	160	ND
8/3/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	42	--	ND	ND	--	--	22	ND	190	4.1
7/25/2012	16	ND	ND	--	ND	ND	ND	12	ND	55	--	ND	ND	--	--	56	ND	160	6.2
9/17/2013	11	ND	ND	--	ND	ND	ND	8.4	ND	40	--	ND	ND	--	--	40	ND	140	4
9/10/2014	ND	ND	ND	--	ND	ND	ND	ND	ND	18	--	ND	ND	--	--	11	ND	78	ND
8/5/2015	ND	ND	ND	--	ND	ND	ND	ND	ND	21	--	ND	ND	--	--	12	ND	92	ND
8/10/2016	ND	ND	ND	--	ND	ND	ND	ND	ND	29	--	ND	ND	--	--	14	ND	110	ND
MW-16																			
2/10/2003	ND	ND	ND	--	ND	ND	ND	ND	--	ND	--	ND	ND	ND	--	ND	ND	ND	ND
2/28/2007	ND	ND	ND	--	ND	ND	ND	ND	--	ND	--	ND	ND	ND	--	ND	ND	ND	ND
8/20/2009	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
11/16/2009	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
2/18/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
5/5/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/11/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
11/29/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
2/22/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
5/9/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/1/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
7/25/2012	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
9/16/2013	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
9/10/2014	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/4/2015	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/9/2016	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND

Units: µg/L
ND: Non-detect
--: not measured

Table 3.2
Time Series Data for Detected VOCs in Groundwater

Location/Date	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Acenaphthene	Acetone	Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Fluorene	Freon-11	Isopropylbenzene	Naphthalene	Phenanthrene	Tetrachloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
MW-17																			
2/10/2003	ND	ND	ND	--	59	ND	ND	ND	--	ND	--	ND	ND	ND	--	ND	ND	ND	ND
2/28/2007	ND	ND	ND	--	ND	ND	ND	ND	--	ND	--	ND	ND	ND	--	ND	ND	ND	ND
8/19/2009	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
11/16/2009	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
2/18/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
5/5/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/11/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
11/29/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
2/22/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
5/9/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/3/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
7/25/2012	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
9/17/2013	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
9/10/2014	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/5/2015	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/10/2016	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
MW-18																			
8/19/2009	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
11/16/2009	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
2/18/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
5/6/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/12/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
11/29/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
2/23/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
5/9/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/2/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
7/25/2012	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
9/17/2013	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
9/11/2014	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/5/2015	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/10/2016	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND

Units: µg/L
ND: Non-detect
--: not measured

Table 3.2
Time Series Data for Detected VOCs in Groundwater

Location/Date	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Acenaphthene	Acetone	Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Fluorene	Freon-11	Isopropylbenzene	Naphthalene	Phenanthrene	Tetrachloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
MW-19																			
8/19/2009	7.5	ND	ND	--	ND	ND	ND	8.3	ND	44	--	ND	ND	--	--	23	ND	170	7.8
11/16/2009	ND	ND	ND	--	ND	ND	ND	ND	ND	30	--	ND	ND	--	--	18	ND	160	3.9
2/18/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	21	--	ND	ND	--	--	19	ND	130	2.9
5/5/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	34	--	ND	ND	--	--	21	ND	150	6
8/11/2010	6.5	ND	ND	--	ND	ND	ND	6.5	ND	35	--	ND	ND	--	--	22	ND	150	8.8
11/29/2010	9.6	ND	ND	--	ND	ND	ND	10	ND	40	--	ND	ND	--	--	32	ND	190	9.9
2/22/2011	6.9	ND	ND	--	ND	ND	ND	6.2	ND	35	--	ND	ND	--	--	19	ND	160	4.5
5/10/2011	5.3	ND	ND	--	ND	ND	ND	ND	ND	30	--	ND	ND	--	--	17	ND	130	ND
8/2/2011	7.1	ND	ND	--	ND	ND	ND	6.6	ND	31	--	ND	ND	--	--	20	ND	140	5.1
7/25/2012	5.7	ND	ND	--	ND	ND	ND	5.3	ND	35	--	ND	ND	--	--	22	ND	180	6.1
9/16/2013	ND	ND	ND	--	ND	ND	ND	ND	ND	26	--	ND	ND	--	--	19	ND	140	4
9/10/2014	13	ND	ND	--	ND	ND	ND	13	ND	47	--	ND	ND	--	--	27	ND	140	9.1
8/5/2015	8.4	ND	ND	--	ND	ND	ND	8.2	ND	31	--	ND	ND	--	--	24	ND	130	4.5
8/9/2016	9.3	ND	ND	--	ND	ND	ND	7.9	ND	42	--	ND	ND	--	--	20	ND	160	7.3
MW-20																			
2/23/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	13	--	ND	ND	--	--	6	ND	49	3.8
5/10/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	14	--	ND	ND	--	--	5.5	ND	48	2.1
8/2/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	15	--	ND	ND	--	--	7.2	ND	57	4.2
7/25/2012	ND	ND	ND	--	ND	ND	ND	ND	ND	20	--	ND	ND	--	--	6.7	ND	65	5.2
9/16/2013	ND	ND	ND	--	ND	ND	ND	ND	ND	16	--	ND	ND	--	--	5.8	ND	51	11
9/10/2014	ND	ND	ND	--	ND	ND	ND	ND	ND	14	--	ND	ND	--	--	5.1	ND	46	6
8/5/2015	ND	ND	ND	--	ND	ND	ND	ND	ND	12	--	ND	ND	--	--	6.5	ND	47	3.2
8/9/2016	ND	ND	ND	--	ND	ND	ND	ND	ND	16	--	ND	ND	--	--	5.6	ND	49	7.2
MW-21																			
2/24/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
5/10/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/2/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
7/25/2012	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
9/16/2013	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
9/10/2014	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/5/2015	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/9/2016	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
MW-9D																			
6/28/2000	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2/7/2003	ND	ND	ND	--	ND	ND	ND	ND	--	ND	--	ND	ND	ND	--	ND	ND	ND	ND
NS-1																			
8/5/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
TW-01																			
3/1/2000	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2/7/2003	ND	ND	ND	--	ND	ND	ND	ND	--	ND	--	ND	ND	ND	--	ND	ND	ND	ND

Units: µg/L
ND: Non-detect
--: not measured

Table 3.2
Time Series Data for Detected VOCs in Groundwater

Location/Date	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Acenaphthene	Acetone	Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Fluorene	Freon-11	Isopropylbenzene	Naphthalene	Phenanthrene	Tetrachloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
TW-02																			
5/29/2000	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	1	23.1	ND	ND	ND	ND	ND
2/19/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
5/6/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/11/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
11/30/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
2/23/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
5/9/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/1/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
7/24/2012	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/10/2016	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
TW-03																			
5/29/2000	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	1.5	ND	ND	ND	ND	ND	ND	ND
6/30/2000	ND	ND	ND	--	ND	ND	ND	ND	--	ND	--	ND	ND	ND	--	ND	ND	ND	ND
2/7/2003	ND	ND	ND	--	ND	ND	ND	ND	--	ND	--	ND	ND	ND	--	ND	ND	ND	ND
8/20/2009	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
5/6/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/11/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
11/30/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
2/22/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
5/9/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/1/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
7/24/2012	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
9/18/2013	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
9/11/2014	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/6/2015	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/10/2016	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND

Units: µg/L
ND: Non-detect
--: not measured

Table 3.2
Time Series Data for Detected VOCs in Groundwater

Location/Date	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Acenaphthene	Acetone	Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Fluorene	Freon-11	Isopropylbenzene	Naphthalene	Phenanthrene	Tetrachloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
TW-04																			
5/29/2000	ND	ND	3.1	ND	ND	ND	ND	15.4	--	2.4	ND	ND	ND	ND	ND	ND	ND	ND	1.4
9/13/2000	ND	ND	ND	--	ND	ND	ND	4.9	--	4.4	--	ND	ND	ND	--	4.6	ND	ND	ND
10/2/2002	--	--	--	--	ND	ND	ND	ND	--	ND	--	--	--	--	--	ND	ND	ND	ND
1/14/2003	ND	ND	ND	--	ND	ND	ND	ND	--	1.1	--	ND	ND	ND	--	ND	ND	ND	ND
3/2/2007	ND	ND	ND	--	ND	ND	ND	ND	--	ND	--	ND	ND	ND	--	ND	ND	ND	ND
8/20/2009	ND	ND	ND	--	ND	ND	ND	5.6	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
11/17/2009	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
2/19/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
5/6/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/11/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
11/30/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
2/22/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
5/9/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/2/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
7/24/2012	ND	ND	ND	--	ND	ND	ND	5.4	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
9/18/2013	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
9/11/2014	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/6/2015	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
8/10/2016	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	ND	ND	ND	ND
TW-07																			
6/29/2000	ND	ND	ND	--	ND	ND	ND	ND	--	ND	--	ND	ND	ND	--	ND	ND	ND	ND
2/7/2003	ND	ND	ND	--	ND	ND	ND	ND	--	ND	--	ND	ND	ND	--	ND	ND	ND	ND
3/1/2007	ND	ND	ND	--	ND	ND	ND	ND	--	ND	--	ND	ND	ND	--	ND	ND	ND	ND
TW-08																			
6/28/2000	ND	ND	ND	--	ND	ND	ND	ND	--	13.5	--	ND	ND	ND	--	ND	ND	ND	5.2
9/13/2000	ND	ND	ND	--	ND	ND	ND	ND	--	19.9	--	ND	ND	ND	--	3.4	ND	ND	8.2
9/30/2002	--	--	--	--	ND	ND	ND	ND	--	15	--	--	--	--	--	ND	1	ND	7.4
1/14/2003	ND	ND	ND	--	ND	ND	ND	ND	--	11	--	ND	ND	ND	--	ND	ND	ND	7.1
3/1/2007	ND	ND	ND	--	ND	ND	ND	ND	--	16	--	ND	ND	ND	--	ND	ND	ND	9
8/21/2009	ND	ND	ND	--	ND	ND	ND	ND	ND	14	--	ND	ND	--	--	ND	ND	ND	7.3
11/16/2009	ND	ND	ND	--	ND	ND	ND	ND	ND	8.6	--	ND	ND	--	--	ND	ND	ND	4.5
2/18/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	5.6	--	ND	ND	--	--	ND	ND	ND	ND
5/5/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	8.2	--	ND	ND	--	--	ND	ND	ND	4.3
8/11/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	12	--	ND	ND	--	--	ND	ND	ND	6.4
11/29/2010	ND	ND	ND	--	ND	ND	ND	ND	ND	14	--	ND	ND	--	--	ND	ND	ND	5.9
2/22/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	11	--	ND	ND	--	--	ND	ND	ND	4.8
5/9/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	8.4	--	ND	ND	--	--	ND	ND	ND	2.6
8/2/2011	ND	ND	ND	--	ND	ND	ND	ND	ND	9.5	--	ND	ND	--	--	ND	ND	ND	5.9
7/25/2012	ND	ND	ND	--	ND	ND	ND	ND	ND	15	--	ND	ND	--	--	ND	ND	ND	11
9/18/2013	ND	ND	ND	--	ND	ND	ND	ND	ND	6.3	--	ND	ND	--	--	ND	ND	ND	3
9/11/2014	ND	ND	ND	--	ND	ND	ND	ND	ND	10	--	ND	ND	--	--	ND	ND	ND	3.3
8/5/2015	ND	ND	ND	--	ND	ND	ND	ND	ND	9.4	--	ND	ND	--	--	ND	ND	ND	3.8
8/10/2016	ND	ND	ND	--	ND	ND	ND	ND	ND	11	--	ND	ND	--	--	ND	ND	ND	6.2

Units: µg/L
ND: Non-detect
--: not measured

Table 3.2
Time Series Data for Detected VOCs in Groundwater

Location/Date	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Acenaphthene	Acetone	Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Fluorene	Freon-11	Isopropylbenzene	Naphthalene	Phenanthrene	Tetrachloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
TW-09																			
6/30/2000	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2/7/2003	ND	ND	ND	--	ND	ND	ND	ND	--	ND	--	ND	ND	ND	--	ND	ND	ND	ND
TW-10																			
6/29/2000	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2/7/2003	ND	ND	ND	--	ND	ND	ND	ND	--	ND	--	ND	ND	ND	--	ND	ND	ND	ND

Units: µg/L
ND: Non-detect
--: not measured

Table 5.1
Time Series Data for Measured LNAPL Free Product

Measurement Date	EW-10	EW-11	EW-12	EW-13	EW-14	MW-02	SSB-1	TW-01	TW-02	TW-1	TW-16	TW-17
1/31/2008	0.1	ND	ND	0.4	ND	2.5	--	--	--	ND	3.63	3.7
3/14/2008	0.05	ND	ND	ND	ND	6.7	--	--	--	ND	1.55	ND
3/25/2008	0.74	ND	ND	ND	ND	0.22	--	--	--	--	--	0.02
6/11/2008	2.2	ND	0.07	0.4	ND	0.4	--	--	--	ND	1.55	4.35
8/20/2008	2.55	ND	0.09	ND	0.52	0.7	--	--	--	--	--	0.36
9/11/2008	2.63	ND	ND	ND	ND	0.08	--	--	--	ND	1.8	0.02
11/25/2008	ND	ND	ND	ND	0.05	ND	--	--	--	ND	0.42	ND
1/5/2009	0.7	ND	ND	ND	ND	1.76	--	--	--	ND	ND	0.13
3/20/2009	1.02	ND	1.15	3.2	0.56	2.18	--	--	--	--	--	ND
3/30/2009	--	--	--	--	--	--	--	--	--	ND	1.13	--
6/17/2009	0.66	ND	ND	0.93	1.48	1.31	--	--	--	ND	3.14	ND
9/11/2009	2.34	ND	ND	1.55	0.99	0.78	--	--	--	--	--	0.39
1/15/2010	6.43	ND	ND	ND	ND	2.86	--	--	--	ND	2.87	0.11
6/29/2010	9.05	ND	0.56	--	ND	2.18	0.11	--	--	ND	ND	0.13
8/17/2010	0.47	ND	ND	--	ND	1.1	1.05	--	--	ND	0.01	ND
8/30/2010	2.47	ND	ND	--	ND	2.06	1.24	--	--	ND	1.03	0.01
9/22/2010	1.29	ND	0.95	--	ND	1.64	2.17	--	--	ND	1.18	0.04
2/21/2011	0.28	ND	ND	--	0.02	1.86	1.1	--	--	ND	0.33	1.52
5/9/2011	2.47	ND	0.23	ND	0.07	0.87	--	--	--	--	--	ND
8/1/2011	0.13	ND	0.61	0.67	ND	5.19	--	--	--	--	--	0.89
2/3/2012	5.62	ND	0.21	--	0.69	0.35	3.74	--	--	ND	0.6	0.24
11/1/2012	--	ND	0.22	--	0.65	--	3.66	--	--	ND	0.48	--
5/1/2013	7.78	ND	3.23	--	2.33	2.28	1.93	--	--	ND	3.59	1.76
4/22/2014	7.41	ND	2.52	7.49	3.74	5.53	2.22	--	--	ND	0.73	0.07
6/1/2014	ND	ND	2.32	ND	ND	1.1	2.09	--	--	ND	1.43	ND
10/15/2014	5.16	ND	2.36	ND	--	1.9	0.22	--	--	ND	0.46	0.55
2/1/2015	2.57	ND	1.8	0.09	0.05	2.79	0.38	--	--	ND	0.02	8.1
5/1/2015	3.81	ND	2.01	0.73	0.31	3.43	0.99	--	--	ND	0.69	0.04
8/1/2015	3.3	ND	2.2	0.65	0.4	1.5	ND	--	--	ND	0.15	0.21
12/1/2015	0.86	ND	2.39	0.62	0.35	1.01	0.34	--	--	ND	0.16	0.04
4/1/2016	6.76	ND	1.85	1.38	--	5.46	0.97	ND	ND	--	0.76	0.04
8/1/2016	6.8	ND	2.41	ND	--	2.06	0.06	ND	ND	--	0.25	0.27

Units: feet
ND: Non-detect
--: not measured

Table 5.1
Time Series Data for Measured LNAPL Free Product

Measurement Date	TW-18	TW-19	TW-2	TW-20	TW-22	TW-23	TW-24	TW-25	TW-26	TW-27	TW-28	TW-29
1/31/2008	8.92	4.52	ND	4.5	1.09	2.1	2.35	ND	1.12	--	3.38	10.17
3/14/2008	1.6	ND	ND	ND	0.15	--	3.45	ND	0.7	--	4.7	6.85
3/25/2008	0.62	ND	--	0.57	--	--	--	--	--	--	--	--
6/11/2008	9.05	1.4	ND	ND	0.15	--	3.45	ND	0.71	ND	4.7	6.85
8/20/2008	10.22	0.85	--	ND	--	--	--	--	--	--	--	--
9/11/2008	0.74	0.95	0.14	ND	0.03	6.35	1.13	0.05	ND	ND	1.18	5.81
11/25/2008	0.02	1.48	0.02	ND	0.23	5.91	0.29	ND	0.06	ND	1.84	3.73
1/5/2009	2.55	1.75	ND	1.93	0.31	1.25	0.91	ND	0.34	4.72	7.54	ND
3/20/2009	1.21	ND	--	ND	--	--	--	--	--	--	--	--
3/30/2009	--	--	ND	--	0.28	11.5	1.31	ND	0.34	ND	4	9.25
6/17/2009	9.47	3.4	ND	ND	0.21	13.32	1.34	ND	0.21	0.69	9.1	ND
9/11/2009	9.73	ND	--	ND	--	--	--	--	--	--	--	--
1/15/2010	12.5	5.81	ND	0.14	0.21	15.06	1.37	ND	0.11	0.99	10.59	ND
6/29/2010	12.62	ND	ND	ND	1.05	ND	2.96	10.84	0.05	0.84	2.31	ND
8/17/2010	1.1	6.15	ND	ND	ND	0.4	1.81	ND	ND	ND	1.77	1.75
8/30/2010	11.33	6.75	ND	ND	0.14	3.95	2.54	ND	ND	ND	1.69	2
9/22/2010	5.41	6.75	ND	ND	0.15	0.7	1.36	ND	ND	ND	0.45	1.74
2/21/2011	5.9	1.06	ND	0.26	0.47	1.37	0.97	ND	ND	ND	7.99	8.7
5/9/2011	6.02	1.3	--	0.23	--	--	--	--	--	--	--	--
8/1/2011	0.3	0.01	--	0.04	--	--	--	--	--	--	--	--
2/3/2012	1.06	2.25	ND	1.12	0.01	1.19	1	ND	ND	ND	3.04	3.64
11/1/2012	--	2.35	ND	--	0.01	1.03	0.84	ND	ND	ND	2.84	3.1
5/1/2013	3.91	1.68	ND	2.06	0.15	13.85	0.21	ND	0.12	ND	5.15	9.51
4/22/2014	13.39	1.31	ND	2.54	0.05	15.44	6.23	ND	ND	ND	2.84	10.13
6/1/2014	0.03	ND	0.01	0.01	0.12	2.87	3.9	ND	ND	ND	0.02	2.38
10/15/2014	10.32	ND	ND	0.94	0.1	3.83	1.61	ND	ND	ND	ND	5.31
2/1/2015	0.05	0.25	ND	1.01	ND	1.15	4.15	ND	ND	ND	0.17	3.33
5/1/2015	10.09	0.62	ND	1.16	ND	5.86	4.87	ND	ND	ND	0.06	4.65
8/1/2015	10.55	1.85	ND	0.03	0.03	2	1.98	ND	ND	ND	ND	1.78
12/1/2015	6.14	1.33	ND	0.4	ND	0.41	0.51	ND	ND	ND	0.37	0.91
4/1/2016	8.11	3.14	--	1.09	ND	9.5	1.64	ND	ND	ND	0.07	7.44
8/1/2016	10.15	--	--	0.09	0.01	3.47	2.17	ND	ND	ND	0.03	6.64

Units: feet
ND: Non-detect
--: not measured

Table 5.1
Time Series Data for Measured LNAPL Free Product

Measurement Date	TW-30	TW-31	TW-32	TW-33	TW-34
1/31/2008	ND	--	ND	ND	ND
3/14/2008	ND	ND	ND	ND	ND
3/25/2008	--	--	--	--	--
6/11/2008	ND	ND	ND	ND	ND
8/20/2008	--	--	--	--	--
9/11/2008	ND	ND	ND	ND	ND
11/25/2008	ND	ND	ND	ND	ND
1/5/2009	ND	ND	ND	ND	--
3/20/2009	--	--	--	--	--
3/30/2009	ND	ND	ND	ND	ND
6/17/2009	ND	ND	ND	ND	--
9/11/2009	--	--	--	--	--
1/15/2010	ND	ND	ND	ND	--
6/29/2010	ND	ND	ND	ND	ND
8/17/2010	ND	ND	ND	ND	ND
8/30/2010	ND	ND	ND	ND	ND
9/22/2010	ND	ND	ND	ND	ND
2/21/2011	ND	ND	ND	0.44	ND
5/9/2011	--	--	--	--	--
8/1/2011	--	--	--	--	--
2/3/2012	ND	ND	0.05	ND	ND
11/1/2012	ND	ND	0.1	ND	ND
5/1/2013	ND	ND	1.09	0.1	ND
4/22/2014	ND	ND	0.95	ND	ND
6/1/2014	ND	ND	ND	ND	ND
10/15/2014	ND	ND	ND	ND	ND
2/1/2015	ND	ND	ND	ND	ND
5/1/2015	ND	ND	ND	ND	ND
8/1/2015	ND	ND	ND	ND	ND
12/1/2015	ND	ND	0.04	ND	ND
4/1/2016	ND	ND	0.04	ND	ND
8/1/2016	ND	ND	0.03	ND	ND

Units: feet
ND: Non-detect
--: not measured

Table 5.2
2019 Groundwater PAH Assessment Summary

Parameter	MW-01		TW-01		TW-08		TW-31		TW-33	
	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL
1-Methylnaphthalene	ND	0.50	ND	0.50	ND	0.5	ND	0.5	3.2	0.5
2-Methylnaphthalene	ND	0.50	ND	0.50	ND	0.5	ND	0.5	ND	0.5
Acenaphthene	ND	0.50	ND	0.50	ND	0.5	ND	0.5	4.4	0.5
Acenaphthylene	ND	1.00	ND	1.00	ND	1	ND	1	ND	1
Anthracene	ND	0.05	ND	0.05	ND	0.05	ND	0.05	0.48	0.05
Benzo(a)anthracene	ND	0.05	ND	0.05	ND	0.05	ND	0.05	0.25	0.05
Benzo(a)pyrene	ND	0.05	ND	0.05	ND	0.05	ND	0.05	0.22	0.05
Benzo(b)fluoranthene	ND	0.10	ND	0.10	ND	0.1	ND	0.1	0.31	0.1
Benzo(g,h,i)perylene	ND	0.10	ND	0.10	ND	0.1	ND	0.1	0.23	0.1
Benzo(k)fluoranthene	ND	0.05	ND	0.05	ND	0.05	ND	0.05	0.2	0.05
Chrysene	ND	0.05	ND	0.05	ND	0.05	ND	0.05	0.22	0.05
Dibenzo(a,h)anthracene	ND	0.10	ND	0.10	ND	0.1	ND	0.1	0.18	0.1
Fluoranthene	ND	0.10	ND	0.10	ND	0.1	ND	0.1	0.31	0.1
Fluorene	ND	0.10	ND	0.10	ND	0.1	ND	0.1	4.4	0.1
Indeno(1,2,3-cd)pyrene	ND	0.05	ND	0.05	ND	0.05	ND	0.05	0.23	0.05
Naphthalene	ND	0.50	ND	0.50	ND	0.5	ND	0.5	0.92	0.5
Phenanthrene	ND	0.05	ND	0.05	ND	0.05	ND	0.05	2.2	0.05
Pyrene	ND	0.05	ND	0.05	0.4	0.05	ND	0.05	0.3	0.05

Units: µg/L

Table 6.1
Post Removal Soil Lead Data Summary (0-2 ft-bgs)

Location	Date Sampled	Sample Depth		Result	Location		Sample Purpose
		Top (ft)	Bottom (ft)	(mg/kg)	X	Y	
AA65	07/15/11	1	1	294	2462270.75	1028280.67	Confirmational
AA66	07/15/11	1	1	229	2462267.77	1028271.31	Confirmational
aa66-S	07/15/11	0	1	254	2462262.73	1028271.60	Confirmational
B-01	02/23/00	1	1	210	2462325.00	1028248.08	Delineation
B-02	02/24/00	1	1	200	2462237.12	1028202.86	Delineation
B-03	02/23/00	1	1	16	2462388.93	1028146.52	Delineation
B-04	02/24/00	1	1	350	2462124.25	1028229.57	Delineation
b15-6	03/30/09	0	1	432	2462624.89	1028636.62	Delineation
b15-7	03/30/09	1	2	502	2462625.42	1028661.49	Delineation
b15-7	03/30/09	0	1	431	2462625.42	1028661.49	Delineation
b15-9	03/30/09	0	1	427	2462720.50	1028596.75	Delineation
B-19	03/06/00	1	1	92	2462786.66	1029212.78	Delineation
B-2	10/02/02	0	0	1	2462237.12	1028202.86	Delineation
B-22	06/16/00	1	1	480	2462521.41	1028954.30	Delineation
B-23	10/03/02	0	0	630	2462635.47	1029050.06	Delineation
B-23-NE	10/03/02	0	0	239	2462647.43	1029065.53	Delineation
B-23-NW	10/03/02	0	0	654	2462619.26	1029063.29	Delineation
B-23-SE	10/03/02	0	0	567	2462651.27	1029039.92	Delineation
B-23-SW	10/03/02	0	0	476	2462623.03	1029037.44	Delineation
B-24	02/25/00	1	1	80	2462742.83	1028998.68	Delineation
B-29	06/13/00	1	1	77	2462406.90	1028406.23	Delineation
B-2-NE	10/02/02	0	0	ND	2462246.28	1028219.21	Delineation
B-2-NW	10/02/02	0	0	ND	2462220.88	1028214.64	Delineation
B-2-SE	10/02/02	0	0	ND	2462251.70	1028190.34	Delineation
B-2-SW	10/02/02	0	0	ND	2462226.74	1028185.57	Delineation
B-30	03/06/00	1	1	320	2462318.58	1028340.53	Delineation
b-31a	02/24/09	0	0.5	1,290	2462169.78	1028364.13	Delineation
B-31a-1	02/24/09	0	0.5	563	2462152.95	1028373.35	Delineation
B-31a-2	02/24/09	0	0.5	966	2462164.97	1028389.95	Delineation
B-31a-3	02/24/09	0	0.5	1,170	2462178.71	1028378.61	Delineation
B-31a-5	02/24/09	0	0.5	662	2462173.30	1028337.15	Delineation
B-31a-6	02/24/09	0	0.5	984	2462156.38	1028348.01	Delineation
B-31a-7	02/24/09	0	0.5	905	2462141.26	1028360.05	Delineation
B-32	02/24/00	1	1	280	2462196.18	1028163.37	Delineation
B-33	02/25/00	1	1	140	2462086.24	1028181.94	Delineation
B-34	02/24/00	1	1	51	2462099.78	1028210.34	Delineation
B-35	02/24/00	1	1	420	2462063.08	1028221.70	Delineation
B-36	02/24/00	1	1	95	2462053.47	1028198.11	Delineation
B-37	02/25/00	1	1	190	2462747.29	1028978.77	Delineation
B-38	02/25/00	1	1	230	2462766.52	1029004.86	Delineation
B-39	02/25/00	2	2	260	2462738.02	1029024.43	Delineation
B-39	02/25/00	0	0	ND	2462738.02	1029024.43	Delineation
B-40	02/25/00	1	1	440	2462722.92	1028995.25	Delineation
B-41	03/06/00	1	1	75	2462414.56	1028299.12	Delineation
b-42a-101	03/30/09	0	1	638	2462058.68	1028318.28	Delineation
b-42a-102	03/30/09	0	1	384	2462040.72	1028289.96	Delineation
b-42a-103	03/30/09	0	1	476	2462038.56	1028330.13	Delineation
b-42a-104	03/30/09	0	1	826	2462024.35	1028356.59	Delineation
b-42a-105	03/30/09	0	1	560	2462018.18	1028376.13	Delineation
b-42a-106	03/30/09	0	1	801	2462018.20	1028410.95	Delineation
b-42a-107	03/30/09	0	1	327	2462100.57	1028344.98	Delineation
b-42a-108	03/30/09	0	1	484	2462138.86	1028318.73	Delineation
b-42a-108	03/30/09	0	1	312	2462138.86	1028318.73	Delineation
b-42a-110	03/30/09	0	1	1,299	2462202.22	1028297.51	Delineation
b-42a-111	03/30/09	0	1	878	2462169.42	1028307.75	Delineation
b-42a-112	03/30/09	0	1	526	2462185.21	1028273.76	Delineation
b-42a-113	03/30/09	0	1	358	2462232.50	1028277.05	Delineation
b-42a-116	03/30/09	0	1	741	2462256.89	1028255.90	Delineation
b-42a-116	03/30/09	0	1	508	2462256.89	1028255.90	Delineation
b-42a-117	03/30/09	0	1	447	2462300.56	1028255.66	Delineation
b-42a-118	03/30/09	0	1	568	2462266.98	1028575.51	Delineation
b-42a-119	03/30/09	0	1	1,242	2462286.61	1028638.86	Delineation
b-42a-120	03/30/09	0	1	695	2462278.87	1028660.46	Delineation

ft: feet
mg/kg: milligram per kilogram
ND: non-detect result

Table 6.1
Post Removal Soil Lead Data Summary (0-2 ft-bgs)

Location	Date Sampled	Sample Depth		Result	Location		Sample Purpose
		Top (ft)	Bottom (ft)	(mg/kg)	X	Y	
b-42a-121	03/30/09	0	1	544	2462300.30	1028672.71	Delineation
b-42a-122	03/30/09	0	1	398	2462391.97	1028799.98	Delineation
b-42a-123	03/30/09	0	1	1,130	2462388.94	1028763.97	Delineation
b-42a-124	03/30/09	0	1	1,294	2462373.82	1028750.34	Delineation
b-42a-125	03/30/09	0	1	345	2462353.84	1028766.81	Delineation
b-42a-126	03/30/09	0	1	394	2462373.95	1028785.19	Delineation
b-42a-13	03/11/09	0	0.5	403	2462151.38	1028399.60	Delineation
b-42a-14	03/11/09	0	0.5	435	2462155.51	1028411.77	Delineation
b-42a-18	03/11/09	0	0.5	575	2462078.03	1028462.83	Delineation
b-42a-24	03/11/09	0	0.5	781	2462166.11	1028427.13	Delineation
b-42a-28	03/11/09	0	0.5	539	2462089.01	1028477.99	Delineation
b-42a-29	03/11/09	0	0.5	655	2462048.88	1028457.58	Delineation
b-42a-29	03/11/09	0	0.5	487	2462048.88	1028457.58	Delineation
b-42a-30	03/11/09	0	0.5	557	2462037.39	1028439.27	Delineation
b-42a-35	03/11/09	0	0.5	799	2462175.22	1028442.56	Delineation
b-42a-39	03/11/09	0	0.5	745	2462104.02	1028498.18	Delineation
b-42a-40	03/11/09	0	0.5	460	2462186.73	1028460.30	Delineation
b-42a-43	03/11/09	0	0.5	511	2462197.20	1028475.30	Delineation
b-42a-46	03/11/09	0	0.5	630	2462217.03	1028547.37	Delineation
b-42a-47	03/11/09	0	0.5	1,001	2462212.50	1028497.45	Delineation
b-42a-48	03/11/09	0	0.5	888	2462224.77	1028510.45	Delineation
b-42a-49	03/11/09	0	0.5	966	2462231.03	1028484.81	Delineation
b-42a-50	03/11/09	0	0.5	1,242	2462214.38	1028461.36	Delineation
b-42a-51	03/11/09	0	0.5	415	2462243.74	1028498.52	Delineation
b-42a-54	03/11/09	0	0.5	1,004	2462215.48	1028578.00	Delineation
b-42a-55	03/11/09	0	0.5	1,232	2462229.04	1028597.65	Delineation
b-42a-56	03/11/09	0	0.5	519	2462257.23	1028630.05	Delineation
b-42a-57	03/11/09	0	0.5	990	2462244.60	1028612.84	Delineation
b-42a-58	03/11/09	0	0.5	497	2462260.66	1028603.20	Delineation
b-42a-59	03/11/09	0	0.5	1,268	2462244.54	1028582.71	Delineation
b-42a-61	03/11/09	0	0.5	1,028	2462193.89	1028596.80	Delineation
b-42a-62	03/11/09	0	0.5	1,055	2462208.23	1028618.75	Delineation
b-42a-63	03/11/09	0	0.5	1,016	2462222.25	1028639.55	Delineation
b-42a-64	03/11/09	0	0.5	1,002	2462236.76	1028660.52	Delineation
b-42a-66	03/11/09	0	0.5	252	2462276.63	1028724.07	Delineation
b-42a-69	03/11/09	0	0.5	698	2462267.92	1028669.12	Delineation
b-42a-71	03/11/09	0	0.5	327	2462215.97	1028675.69	Delineation
b-42a-71	03/11/09	0	0.5	309	2462215.97	1028675.69	Delineation
b-42a-72	03/11/09	0	0.5	624	2462200.27	1028656.35	Delineation
b-42a-73	03/11/09	0	0.5	420	2462185.24	1028641.11	Delineation
b-42a-74	03/11/09	0	0.5	145	2462174.21	1028612.57	Delineation
b-42a-75	03/11/09	0	0.5	657	2462153.20	1028574.54	Delineation
b-42a-75	03/11/09	0	0.5	650	2462153.20	1028574.54	Delineation
b-42a-76	03/11/09	0	0.5	266	2462137.67	1028552.26	Delineation
b-42a-77	03/11/09	0	0.5	550	2462120.94	1028526.84	Delineation
b-42a-82	03/11/09	0	0.5	452	2462262.56	1028524.34	Delineation
b-42a-83	03/11/09	0	0.5	458	2462281.22	1028550.80	Delineation
b-42a-86	03/11/09	0	0.5	1,228	2462292.94	1028572.05	Delineation
b-42a-89	03/30/09	0	1	720	2462315.48	1028639.12	Delineation
b-42a-89	03/11/09	0	0.5	717	2462315.48	1028639.12	Delineation
B-42-NE	10/03/02	0	0	1,020	2462137.68	1028467.92	Delineation
B-42-NW	10/03/02	0	0	658	2462107.89	1028469.76	Delineation
B-42-SE	10/03/02	0	0	166	2462139.99	1028439.66	Delineation
B-42-SW	10/03/02	0	0	552	2462110.19	1028441.35	Delineation
B-44	06/13/00	1	1	86	2462647.37	1028387.64	Delineation
B-46	06/14/00	1	1	249	2462828.65	1028943.75	Delineation
B-47	06/14/00	1	1	157	2462843.07	1029035.76	Delineation
B-48	06/15/00	1	1	324	2462814.89	1029197.26	Delineation
B-49	06/15/00	2	2	90	2462714.66	1029257.46	Delineation
B-50	06/15/00	1	1	465	2462625.45	1029307.20	Delineation
B-51	06/20/00	1	1	421	2462462.70	1029144.26	Delineation
B-52	06/21/00	1	1	89	2462266.55	1028940.38	Delineation
B-53	06/22/00	1	1	252	2462091.17	1028730.30	Delineation

ft: feet
mg/kg: milligram per kilogram
ND: non-detect result

Table 6.1
Post Removal Soil Lead Data Summary (0-2 ft-bgs)

Location	Date Sampled	Sample Depth		Result	Location		Sample Purpose
		Top (ft)	Bottom (ft)	(mg/kg)	X	Y	
B-54	06/22/00	1	1	82	2461943.60	1028573.80	Delineation
B-57	06/22/00	1	1	221	2462025.97	1028495.56	Delineation
B-58	06/23/00	1	1	245	2461995.08	1028361.03	Delineation
B-62	06/14/00	2	2	102	2462611.78	1028699.17	Delineation
b-63	09/30/02	0	0	ND	2462566.98	1028539.05	Delineation
B-63-2	02/24/09	0	0.5	480	2462522.01	1028543.78	Delineation
b-63-5	03/30/09	1	2	433	2462512.25	1028495.69	Delineation
b-63-5	03/30/09	0	1	314	2462512.25	1028495.69	Delineation
b-63-6	03/30/09	0	1	611	2462506.33	1028528.33	Delineation
b-63-ene5	01/16/03	0	0	199	2462636.79	1028547.44	Delineation
B-63-ESE3	11/08/02	0	0	206	2462615.40	1028513.43	Delineation
b-63-ese5	11/16/03	0	0	7	2462670.16	1028558.18	Delineation
B-63-N2	10/01/02	0	0	103	2462566.18	1028564.47	Delineation
b-63-ne2	09/30/02	0	0	387	2462595.37	1028568.53	Delineation
b-63-se2	10/01/02	0	0	513	2462603.20	1028496.89	Delineation
B-63-SSE5	01/16/03	0	0	524	2462469.04	1028439.73	Delineation
b-63-ssw4	11/08/02	0	0	320	2462554.65	1028469.82	Delineation
B-63-SSW5	01/16/03	0	0	539	2462567.74	1028445.98	Delineation
b-63-sw	10/01/02	0	0	986	2462552.60	1028518.07	Delineation
b-63-sw	10/01/02	0	0	ND	2462552.60	1028518.07	Delineation
b-63-sw2	10/01/02	0	0	728	2462542.77	1028504.00	Delineation
b-65	10/04/02	0	0	5	2462709.57	1028748.22	Delineation
B-65-1	02/24/09	0	0.5	475	2462683.19	1028742.70	Delineation
B-65-10	02/24/09	0	0.5	278	2462773.07	1028593.85	Delineation
B-65-11	02/24/09	0	0.5	669	2462759.00	1028570.02	Delineation
b-65-14	03/30/09	0	1	582	2462733.37	1028586.42	Delineation
b-65-15	03/30/09	0	1	1,287	2462740.68	1028571.98	Delineation
B-65-2	02/24/09	0	0.5	560	2462673.77	1028728.34	Delineation
b-65-21	03/30/09	0	1	427	2462837.73	1028854.02	Delineation
b-65-22	03/30/09	0	1	237	2462808.54	1028814.22	Delineation
b-65-22	03/30/09	0	1	217	2462808.54	1028814.22	Delineation
b-65-23	03/30/09	0	1	2,560	2462859.28	1028881.09	Delineation
b-65-23	03/30/09	0	1	1,276	2462859.28	1028881.09	Delineation
b-65-24	03/30/09	0	1	685	2462838.43	1028897.72	Delineation
b-65-24	03/30/09	0	1	510	2462838.43	1028897.72	Delineation
b-65-24	03/30/09	1	2	354	2462838.43	1028897.72	Delineation
b-65-25	03/30/09	0	1	1,240	2462785.11	1028784.40	Delineation
b-65-25	03/30/09	0	1	863	2462785.11	1028784.40	Delineation
b-65-27	03/30/09	0	1	425	2462870.42	1028768.07	Delineation
b-65-28	03/30/09	0	1	726	2462874.20	1028787.18	Delineation
b-65-29	03/30/09	1	2	253	2462854.87	1028726.22	Delineation
B-65-3	02/24/09	0	0.5	546	2462660.42	1028710.84	Delineation
b-65-30	03/30/09	1	2	332	2462840.58	1028702.90	Delineation
B-65-4	02/24/09	0	0.5	181	2462665.63	1028681.68	Delineation
B-65-5	02/24/09	0	0.5	250	2462653.63	1028666.88	Delineation
b-65-e2	10/04/02	0	0	667	2462741.48	1028750.15	Delineation
B-65-E4	02/08/03	0	0	206	2462789.97	1028796.24	Delineation
b-65-ne	10/04/02	0	0	471	2462720.46	1028766.05	Delineation
b-65-nw	10/04/02	0	0	253	2462691.72	1028756.42	Delineation
b-65-s8	02/08/03	0	0	108	2462730.28	1028633.87	Delineation
b-65-sw	10/04/02	0	0	1,250	2462699.19	1028731.78	Delineation
b-65-sw2	10/04/02	0	0	1,050	2462688.86	1028716.70	Delineation
b-65-sw3	01/16/03	0	0	346	2462678.78	1028699.08	Delineation
B-77	09/19/00	1	1	6	2462820.47	1028461.77	Delineation
B-80	09/20/00	1	1	27	2462966.27	1028726.90	Delineation
B-81	09/20/00	1	1	113	2463007.68	1028932.14	Delineation
B-83	09/20/00	1	1	364	2462924.53	1029180.48	Delineation
B-84	09/19/00	1	1	23	2462844.89	1029321.04	Delineation
B-85	09/19/00	1	1	258	2462705.40	1029435.91	Delineation
B-86	09/19/00	1	1	147	2462551.15	1029377.30	Delineation
B-87	09/19/00	1	1	201	2462410.32	1029185.46	Delineation
B-89	09/19/00	1	1	119	2462060.28	1028793.44	Delineation
B-90	09/20/00	1	1	6	2462187.26	1028610.18	Delineation

ft: feet
mg/kg: milligram per kilogram
ND: non-detect result

Table 6.1
Post Removal Soil Lead Data Summary (0-2 ft-bgs)

Location	Date Sampled	Sample Depth		Result	Location		Sample Purpose
		Top (ft)	Bottom (ft)	(mg/kg)	X	Y	
B-94	09/20/00	1	1	95	2461845.45	1028413.88	Delineation
B-95	09/20/00	1	1	160	2461945.66	1028213.46	Delineation
BB65	07/15/11	1	1	345	2462281.10	1028276.95	Confirmational
BB66	07/15/11	0	1	719	2462277.36	1028268.71	Confirmational
FF38	07/16/11	0	1	27	2462550.89	1028552.47	Confirmational
FF39	07/16/11	1	1	194	2462541.24	1028543.00	Confirmational
FF40	07/16/11	1	1	805	2462532.71	1028531.78	Confirmational
ff40-S	07/16/11	0	1	719	2462531.65	1028538.87	Confirmational
FF41	07/16/11	1	1	409	2462523.87	1028520.47	Confirmational
ff41-S	07/16/11	0	1	261	2462514.82	1028520.04	Confirmational
G41	07/27/11	0	1	129	2462239.50	1028716.21	Confirmational
G65	07/26/11	0	1	1,100	2462046.51	1028440.65	Confirmational
G67	07/26/11	0	1	703	2462032.99	1028423.80	Confirmational
GG26	07/30/11	0	1	200	2462659.70	1028681.54	Confirmational
GG36	07/16/11	0	1	22	2462572.39	1028563.84	Confirmational
GG37	07/16/11	1	1	723	2462566.60	1028555.74	Confirmational
GG38	07/16/11	1	1	25	2462557.41	1028546.82	Confirmational
gg38-S	07/16/11	0	1	156	2462565.64	1028544.69	Confirmational
GG39	07/16/11	0	1	56	2462549.97	1028534.52	Confirmational
gg39-S	07/16/11	0	1	44	2462551.06	1028526.09	Confirmational
GG40	07/16/11	1	1	435	2462540.25	1028524.35	Confirmational
GG41	07/16/11	1	1	348	2462533.75	1028513.82	Confirmational
gg41-S	07/16/11	0	1	26	2462539.04	1028511.14	Confirmational
GG42	07/16/11	0	1	573	2462522.21	1028503.41	Confirmational
H40	07/14/11	1	2	440	2462255.14	1028720.72	Confirmational
H40	07/14/11	0	1	210	2462255.14	1028720.72	Confirmational
H41	07/27/11	1	1	125	2462250.09	1028711.23	Confirmational
H41-S	07/14/11	1	2	39	2462250.09	1028711.23	Confirmational
H42	07/14/11	0	1	918	2462242.76	1028700.15	Confirmational
H42	07/14/11	1	2	32	2462242.76	1028700.15	Confirmational
H51-S	08/16/11	0	1	88	2462171.85	1028583.55	Confirmational
H53-S	08/04/11	0	1	304	2462156.09	1028573.54	Confirmational
H64-S	07/26/11	0	1	771	2462065.50	1028449.82	Confirmational
H65	07/25/11	1	1	1,170	2462054.44	1028437.16	Confirmational
H66	07/25/11	1	1	896	2462045.62	1028424.91	Confirmational
H67	07/25/11	1	1	740	2462037.46	1028415.10	Confirmational
H68	07/25/11	1	1	36	2462031.27	1028403.01	Confirmational
H68-S	07/26/11	0	1	249	2462026.74	1028406.24	Confirmational
ha-01	10/01/02	0	0	20	2462430.84	1028814.76	Delineation
ha-01	10/01/02	0	0	ND	2462430.84	1028814.76	Delineation
HA-01-a	02/24/09	0	0.5	655	2462405.60	1028812.81	Delineation
HA-01-c	02/24/09	0	0.5	1,240	2462431.11	1028787.24	Delineation
ha-01-ne	10/01/02	0	0	1	2462441.41	1028829.12	Delineation
ha-01-ne	10/01/02	0	0	ND	2462441.41	1028829.12	Delineation
ha-01-nw	10/01/02	0	0	428	2462413.35	1028822.48	Delineation
ha-01-nw	10/01/02	0	0	2	2462413.35	1028822.48	Delineation
ha-01-sw	02/24/09	0	0.5	1,230	2462421.93	1028800.88	Delineation
ha-01-sw	10/02/02	0	0	952	2462421.93	1028800.88	Delineation
ha-01-sw	10/02/02	0	0	ND	2462421.93	1028800.88	Delineation
HA-04	03/06/00	0	0	340	2462530.44	1028578.59	Delineation
HA-07	03/06/00	1	1	390	2462577.46	1029120.13	Delineation
HA-08	03/06/00	1	1	370	2462489.77	1029140.14	Delineation
HH20-S	07/30/11	0	1	ND	2462720.36	1028748.36	Confirmational
HH21	07/30/11	1	1	16	2462717.42	1028739.08	Confirmational
HH21-SE	07/30/11	0	1	304	2462711.49	1028745.71	Confirmational
HH21-SS	07/30/11	0	1	22	2462709.14	1028733.39	Confirmational
HH25	07/30/11	0	1	10	2462671.18	1028680.72	Confirmational
HH26	07/30/11	1	1	21	2462666.54	1028674.44	Confirmational
HH27	07/30/11	0	1	7	2462661.86	1028669.85	Confirmational
HH28	07/23/11	1	1	741	2462652.42	1028654.47	Confirmational
HH28-S	07/23/11	0	1	1,290	2462648.26	1028655.95	Confirmational
HH29	07/23/11	0	1	465	2462643.85	1028637.58	Confirmational
HH36	07/16/11	0	1	827	2462581.13	1028560.61	Confirmational

ft: feet
mg/kg: milligram per kilogram
ND: non-detect result

Table 6.1
Post Removal Soil Lead Data Summary (0-2 ft-bgs)

Location	Date Sampled	Sample Depth		Result	Location		Sample Purpose
		Top (ft)	Bottom (ft)	(mg/kg)	X	Y	
HH37	08/04/11	1	1	38	2462579.71	1028552.68	Confirmational
HH37-S	08/04/11	0	1	110	2462585.91	1028550.81	Confirmational
I39	08/09/11	1	2	828	2462271.77	1028722.72	Confirmational
I39	07/27/11	0	1	594	2462271.77	1028722.72	Confirmational
I40-S	07/14/11	1	2	413	2462268.25	1028713.86	Confirmational
I41	07/14/11	2	2	192	2462254.65	1028703.50	Confirmational
I43	07/27/11	0	1	1,290	2462246.17	1028684.55	Confirmational
I43	07/27/11	1	2	73	2462246.17	1028684.55	Confirmational
I50-SE	08/16/11	0	1	109	2462181.38	1028594.21	Confirmational
I51	08/16/11	1	1	69	2462655.59	1028588.56	Confirmational
I51-S	08/16/11	0	1	107	2462788.72	1028622.04	Confirmational
I51-SN	08/16/11	0	1	120	2462170.00	1028596.01	Confirmational
I52-SE	08/04/11	0	1	819	2462172.31	1028577.93	Confirmational
I52-SS	08/04/11	0	1	22	2462166.03	1028574.58	Confirmational
I53	08/04/11	1	1	186	2462162.33	1028566.12	Confirmational
I54	07/26/11	0	1	929	2462154.87	1028549.86	Confirmational
I54-S	08/04/11	0	1	876	2462157.70	1028560.51	Confirmational
I56	07/26/11	0	1	807	2462139.67	1028534.70	Confirmational
I57	07/25/11	1	1	656	2462133.26	1028519.85	Confirmational
I57-S	07/26/11	0	1	653	2462127.36	1028518.70	Confirmational
I57-S1	08/03/11	1	2	70	2462135.32	1028519.78	Confirmational
I58	07/25/11	1	1	31	2462123.77	1028506.76	Confirmational
I59	07/25/11	1	1	189	2462113.94	1028496.34	Confirmational
I59-S	07/26/11	0	1	855	2462114.64	1028503.53	Confirmational
I59-S1	08/03/11	1	2	531	2462144.76	1028467.79	Confirmational
I60	07/25/11	1	1	1,170	2462101.57	1028487.19	Confirmational
I60-S	07/26/11	0	1	1,090	2462101.57	1028487.19	Confirmational
I61	07/25/11	1	1	291	2462100.23	1028474.14	Confirmational
I62	07/25/11	1	1	201	2462091.69	1028461.39	Confirmational
I62-S	07/26/11	0	1	589	2462090.68	1028469.39	Confirmational
I63	07/25/11	1	1	553	2462080.49	1028453.78	Confirmational
I63-S	07/26/11	0	1	276	2462080.49	1028453.78	Confirmational
I64	07/25/11	1	1	808	2462073.93	1028439.21	Confirmational
I64-S	08/03/11	1	2	9	2462071.68	1028434.46	Confirmational
I65-S	08/03/11	1	2	18	2462061.36	1028422.03	Confirmational
I66	07/25/11	1	1	745	2462057.28	1028416.63	Confirmational
I67	07/25/11	1	1	18	2462048.62	1028405.89	Confirmational
I68	07/25/11	1	1	38	2462042.04	1028395.32	Confirmational
I69	07/25/11	1	1	92	2462035.22	1028383.82	Confirmational
I69-S	07/26/11	0	1	556	2462029.66	1028385.96	Confirmational
II21	07/23/11	0	1	283	2462713.40	1028722.01	Confirmational
II23	07/23/11	0	1	6	2462700.69	1028702.44	Confirmational
II25	07/23/11	0	1	34	2462684.31	1028680.43	Confirmational
II26	07/22/11	1	1	121	2462677.34	1028666.08	Confirmational
II27	07/22/11	1	1	61	2462668.78	1028655.37	Confirmational
II28	07/23/11	1	1	500	2462661.07	1028645.01	Confirmational
II29	07/23/11	1	1	109	2462656.94	1028634.43	Confirmational
II38-S	08/13/11	0	1	75	2462585.23	1028515.86	Confirmational
II38-S	08/13/11	1	2	16	2462585.23	1028515.86	Confirmational
J39	08/09/11	1	2	854	2462284.07	1028713.22	Confirmational
J39	07/27/11	0	1	157	2462284.07	1028713.22	Confirmational
J40	07/14/11	2	2	9	2462275.80	1028707.93	Confirmational
J40-S	07/14/11	1	2	93	2462279.23	1028708.87	Confirmational
J41	07/14/11	2	2	31	2462268.35	1028693.67	Confirmational
J41-S	07/14/11	1	2	282	2462273.77	1028694.39	Confirmational
J42	07/14/11	1	2	237	2462263.30	1028687.06	Confirmational
J43	07/27/11	1	2	108	2462256.84	1028676.49	Confirmational
J43-2	08/09/11	1	1	241	2462252.88	1028671.13	Confirmational
J43-SW	08/09/11	0	1	644	2462247.07	1028675.69	Confirmational
J44-S	08/09/11	0	1	505	2462247.30	1028664.18	Confirmational
J49	08/16/11	1	1	95	2462202.89	1028587.13	Confirmational
J49-S	08/16/11	0	1	222	2462190.07	1028597.85	Confirmational
J50	08/11/11	1	1	775	2462195.42	1028586.96	Confirmational

ft: feet
mg/kg: milligram per kilogram
ND: non-detect result

Table 6.1
Post Removal Soil Lead Data Summary (0-2 ft-bgs)

Location	Date Sampled	Sample Depth		Result	Location		Sample Purpose
		Top (ft)	Bottom (ft)	(mg/kg)	X	Y	
J52	08/04/11	1	1	62	2462178.37	1028573.89	Confirmational
J52-SS	08/04/11	1	2	33	2462182.15	1028564.86	Confirmational
J53	07/26/11	1	1	1,120	2462174.83	1028556.73	Confirmational
J55	07/26/11	1	1	953	2462157.57	1028536.71	Confirmational
J55-S	08/04/11	1	2	365	2462160.85	1028539.98	Confirmational
J56	07/25/11	1	1	29	2462149.69	1028524.33	Confirmational
J56-S	08/03/11	1	2	21	2462147.25	1028519.79	Confirmational
J58	07/25/11	1	1	200	2462133.97	1028502.87	Confirmational
J58-SE	08/03/11	1	2	9	2462137.01	1028500.22	Confirmational
J58-SN	08/03/11	1	2	33	2462135.88	1028506.70	Confirmational
J58-SS	08/03/11	1	2	60	2462130.08	1028497.49	Confirmational
J60	07/25/11	1	1	31	2462117.64	1028477.27	Confirmational
J60-S	08/03/11	1	2	172	2462119.91	1028483.85	Confirmational
J61	07/25/11	1	1	39	2462108.62	1028466.55	Confirmational
J62	07/25/11	1	1	681	2462101.24	1028452.94	Confirmational
J63	07/25/11	1	1	515	2462093.61	1028441.94	Confirmational
J64	07/25/11	1	1	28	2462083.94	1028432.29	Confirmational
J65	07/25/11	1	1	1,220	2462076.62	1028419.83	Confirmational
J65-S	08/03/11	1	2	ND	2462072.98	1028424.65	Confirmational
J66	07/25/11	1	1	188	2462069.65	1028408.61	Confirmational
J67	07/25/11	1	1	10	2462060.15	1028398.87	Confirmational
J68	07/25/11	1	1	109	2462052.52	1028387.22	Confirmational
J69	07/25/11	1	1	24	2462045.25	1028374.12	Confirmational
J70	07/26/11	0	1	566	2462034.91	1028366.47	Confirmational
JJ18	07/23/11	0	1	26	2462748.65	1028748.34	Confirmational
JJ19	07/22/11	1	1	178	2462744.19	1028737.97	Confirmational
JJ19-S	08/10/11	1	2	37	2462741.42	1028735.60	Confirmational
JJ20	07/22/11	1	1	1,280	2462736.98	1028726.97	Confirmational
JJ24	07/22/11	1	1	359	2462706.20	1028680.68	Confirmational
JJ24-S	08/02/11	1	2	249	2462702.23	1028679.49	Confirmational
JJ26	07/22/11	1	1	12	2462688.52	1028658.82	Confirmational
JJ27-SS	08/02/11	1	2	389	2462675.36	1028641.76	Confirmational
JJ27-SW	08/02/11	1	2	109	2462672.11	1028653.14	Delineation
JJ28	07/23/11	1	1	284	2462673.15	1028638.15	Confirmational
JJ29	07/23/11	1	1	387	2462660.29	1028624.33	Confirmational
JJ30	07/23/11	0	1	243	2462653.05	1028615.23	Confirmational
JJ31-S	08/16/11	0	1	26	2462652.09	1028583.01	Confirmational
JJ33-S	08/13/11	0	1	67	2462597.40	1028528.32	Confirmational
JJ34-S	08/10/11	0	1	1,130	2462621.44	1028562.61	Confirmational
JJ35-2	08/10/11	1	1	43	2462617.08	1028555.15	Confirmational
JJ35-SW	08/10/11	0	1	570	2462611.78	1028559.14	Confirmational
JJ36-SE	08/10/11	1	2	138	2462612.18	1028538.43	Confirmational
JJ36-SN	08/10/11	0	1	321	2462611.58	1028546.96	Confirmational
JJ37-S	08/10/11	1	2	875	2462606.23	1028530.61	Confirmational
JJ37-SS	08/13/11	0	1	21	2462585.49	1028526.91	Confirmational
JJ37-SS2	08/13/11	1	2	11	2462585.49	1028526.91	Confirmational
JJ39-SN	08/13/11	0	1	47	2462738.42	1028622.93	Confirmational
JJ39-SN	08/13/11	1	2	15	2462738.42	1028622.93	Confirmational
JJ41	07/18/11	0	1	319	2462566.68	1028481.66	Confirmational
JJ41	07/23/11	0	2	311	2462566.68	1028481.66	Confirmational
K39-S	08/09/11	0	1	141	2462295.44	1028704.33	Confirmational
K40-SS	07/27/11	0	1	11	2462286.07	1028695.00	Confirmational
K42-SE	07/27/11	0	1	106	2462268.36	1028677.54	Confirmational
K42-SE	07/27/11	1	2	31	2462268.36	1028677.54	Confirmational
K42-SN	07/27/11	0	1	881	2462277.24	1028680.12	Confirmational
K42-SN	08/09/11	1	2	261	2462277.24	1028680.12	Confirmational
K43-SE	08/09/11	0	1	208	2462259.15	1028666.68	Confirmational
K50-S	08/16/11	0	1	77	2462202.63	1028599.94	Confirmational
K51	07/26/11	1	1	432	2462199.59	1028570.80	Confirmational
K52	07/26/11	1	1	626	2462192.86	1028561.57	Confirmational
K52-S	08/04/11	1	2	121	2462197.66	1028557.76	Confirmational
K53	07/26/11	1	1	268	2462183.74	1028550.79	Confirmational
K53-S	08/04/11	1	2	206	2462181.95	1028546.07	Confirmational

ft: feet
mg/kg: milligram per kilogram
ND: non-detect result

Table 6.1
Post Removal Soil Lead Data Summary (0-2 ft-bgs)

Location	Date Sampled	Sample Depth		Result	Location		Sample Purpose
		Top (ft)	Bottom (ft)	(mg/kg)	X	Y	
K55	07/26/11	1	1	208	2462168.79	1028528.08	Confirmational
K55-S	08/04/11	1	2	65	2462172.97	1028531.84	Confirmational
K56	07/25/11	1	1	89	2462161.11	1028515.86	Confirmational
K56-S	08/03/11	1	2	1,230	2462164.79	1028514.40	Confirmational
K56-SE	08/04/11	1	2	432	2462164.79	1028514.40	Confirmational
K57	07/25/11	1	1	52	2462153.66	1028504.95	Confirmational
K59	07/15/11	1	1	159	2462135.83	1028481.73	Confirmational
K59-SN	08/03/11	1	2	16	2462130.90	1028485.53	Confirmational
K59-SW	08/03/11	1	2	236	2462130.90	1028485.53	Confirmational
K60	07/15/11	1	1	1,180	2462129.42	1028471.74	Confirmational
K60-S	08/03/11	1	2	40	2462133.74	1028465.48	Confirmational
K61	07/15/11	1	1	737	2462119.87	1028460.20	Confirmational
K62	07/15/11	1	1	28	2462112.72	1028449.54	Confirmational
K63	07/15/11	1	1	163	2462104.47	1028437.26	Confirmational
K64	07/15/11	1	1	112	2462095.84	1028426.17	Confirmational
K65	07/15/11	1	1	85	2462086.10	1028411.95	Confirmational
K66	07/15/11	1	1	279	2462078.13	1028401.34	Confirmational
K67	07/15/11	1	1	523	2462072.89	1028390.41	Confirmational
K68	07/15/11	1	1	30	2462063.07	1028379.96	Confirmational
K69	07/25/11	1	1	330	2462055.06	1028365.47	Confirmational
K70	07/25/11	1	1	702	2462048.63	1028356.05	Confirmational
K71	07/26/11	0	1	820	2462039.93	1028346.44	Confirmational
KK12	07/23/11	0	1	861	2462816.71	1028805.19	Confirmational
KK14	07/23/11	0	1	396	2462804.07	1028790.15	Confirmational
KK15	07/23/11	0	1	123	2462789.70	1028770.00	Confirmational
KK17	07/23/11	0	1	461	2462773.75	1028752.48	Confirmational
KK18	07/21/11	1	1	159	2462763.26	1028741.85	Confirmational
KK19	07/22/11	1	1	319	2462754.16	1028732.96	Confirmational
KK19-SE	08/13/11	1	2	33	2462752.49	1028727.49	Confirmational
KK19-SS	08/13/11	1	2	20	2462206.58	1028413.34	Confirmational
KK20	07/22/11	1	1	919	2462747.17	1028718.69	Confirmational
KK20-S	08/02/11	1	2	661	2462743.78	1028715.45	Confirmational
KK20-SW	08/10/11	1	2	738	2462742.09	1028724.66	Confirmational
KK27-S	08/02/11	1	2	645	2462688.35	1028633.53	Confirmational
KK28	07/23/11	1	1	78	2462681.58	1028630.65	Confirmational
KK29	07/23/11	1	1	35	2462673.75	1028618.35	Confirmational
KK31-S	08/16/11	0	1	33	2462645.93	1028585.99	Confirmational
KK32	08/16/11	1	1	31	2462778.76	1028689.72	Confirmational
KK33	08/13/11	1	1	30	2462637.29	1028574.84	Confirmational
KK34	08/10/11	1	1	519	2462635.40	1028557.55	Confirmational
KK34-SE	08/10/11	0	1	594	2462630.75	1028562.52	Confirmational
KK39	07/18/11	1	1	922	2462592.48	1028502.68	Confirmational
KK40	07/18/11	1	1	644	2462584.57	1028490.29	Confirmational
KK43	07/18/11	0	1	1,200	2462564.63	1028460.59	Confirmational
L40-S	08/09/11	0	1	851	2462296.82	1028693.48	Confirmational
L41	07/27/11	0	1	1,280	2462287.09	1028682.24	Confirmational
L41	08/09/11	1	2	140	2462287.09	1028682.24	Confirmational
L51	07/26/11	1	1	16	2462209.80	1028564.11	Confirmational
L51-S	07/26/11	0	1	88	2462208.92	1028570.95	Confirmational
L51-S1	08/04/11	1	2	33	2462211.33	1028566.17	Confirmational
L53	07/26/11	1	1	160	2462195.79	1028542.71	Confirmational
L53-SE	08/04/11	1	2	197	2462197.66	1028537.18	Confirmational
L53-SN	08/04/11	1	2	62	2462196.80	1028546.89	Confirmational
L54	07/26/11	1	1	104	2462187.05	1028531.37	Confirmational
L54-S	08/04/11	1	2	122	2462181.54	1028533.67	Confirmational
L55	07/26/11	1	1	6	2462177.57	1028521.25	Confirmational
L55-S	08/04/11	1	2	64	2462176.39	1028516.31	Confirmational
L56-S	08/04/11	1	2	101	2462168.89	1028502.45	Confirmational
L57	07/25/11	1	1	124	2462164.24	1028496.00	Confirmational
L57-SW	08/03/11	1	2	257	2462159.10	1028500.77	Confirmational
L58	07/25/11	1	1	609	2462156.49	1028483.89	Confirmational
L58-S	08/03/11	1	2	8	2462151.49	1028489.09	Confirmational
L59	07/15/11	1	1	520	2462148.44	1028472.40	Confirmational

ft: feet
mg/kg: milligram per kilogram
ND: non-detect result

Table 6.1
Post Removal Soil Lead Data Summary (0-2 ft-bgs)

Location	Date Sampled	Sample Depth		Result	Location		Sample Purpose
		Top (ft)	Bottom (ft)	(mg/kg)	X	Y	
L59-S	08/03/11	1	2	5	2462144.76	1028467.79	Confirmational
L61	07/15/11	1	1	27	2462133.22	1028451.01	Confirmational
L61-2	08/03/11	1	1	15	2462135.47	1028453.78	Confirmational
L62	07/15/11	1	1	42	2462125.35	1028437.31	Confirmational
L63	07/15/11	1	1	96	2462117.22	1028425.55	Confirmational
L64	07/15/11	1	1	49	2462109.99	1028415.60	Confirmational
L65	07/15/11	1	1	550	2462100.81	1028404.20	Confirmational
L66	07/15/11	1	1	5	2462092.55	1028391.77	Confirmational
L67	07/15/11	1	1	18	2462085.26	1028380.56	Confirmational
L68	07/15/11	1	1	29	2462076.75	1028368.38	Confirmational
L69	07/25/11	1	1	60	2462068.66	1028356.82	Confirmational
L70	07/25/11	1	1	39	2462059.11	1028346.58	Confirmational
L71	07/25/11	1	1	114	2462056.11	1028333.14	Confirmational
L71-S	07/26/11	0	1	687	2462056.11	1028333.14	Confirmational
LL10	07/21/11	1	1	11	2462839.51	1028825.37	Confirmational
LL11	07/21/11	1	1	323	2462831.66	1028815.58	Confirmational
LL11-S	07/23/11	0	1	327	2462828.59	1028818.29	Confirmational
LL12	07/21/11	1	1	108	2462824.29	1028803.79	Confirmational
LL13	07/21/11	1	1	172	2462815.55	1028793.61	Confirmational
LL14	07/21/11	1	1	323	2462806.85	1028780.74	Confirmational
LL15	07/21/11	1	1	379	2462798.75	1028769.86	Confirmational
LL16	07/21/11	1	1	394	2462789.84	1028758.42	Confirmational
LL17	07/21/11	1	1	161	2462783.07	1028747.48	Confirmational
LL18	07/21/11	1	1	728	2462774.77	1028734.73	Confirmational
LL18-S	08/13/11	1	2	28	2462759.32	1028729.64	Confirmational
LL20	07/22/11	1	1	84	2462758.51	1028712.85	Confirmational
LL22	07/22/11	1	1	235	2462741.30	1028687.10	Confirmational
LL24	07/22/11	1	1	62	2462725.66	1028665.21	Confirmational
LL25	07/22/11	1	1	9	2462715.83	1028653.33	Confirmational
LL25-SN	08/13/11	1	2	66	2462647.46	1028578.97	Confirmational
LL26	07/22/11	1	1	70	2462710.70	1028644.21	Confirmational
LL27	07/23/11	1	1	187	2462702.54	1028633.70	Confirmational
LL28	07/23/11	1	1	265	2462694.20	1028623.89	Confirmational
LL29	07/23/11	1	1	487	2462686.98	1028606.95	Confirmational
LL31	07/30/11	0	1	549	2462674.86	1028589.64	Confirmational
LL42	07/18/11	1	1	1,020	2462582.79	1028460.19	Confirmational
LL43	07/18/11	0	1	999	2462576.38	1028449.84	Confirmational
LL9	07/21/11	1	1	100	2462848.58	1028834.71	Confirmational
LL9-S	07/23/11	0	1	115	2462848.15	1028839.05	Confirmational
M52	07/26/11	0	1	983	2462217.02	1028551.26	Confirmational
M52-S	08/04/11	1	2	175	2462210.99	1028541.01	Confirmational
M54	07/26/11	1	1	921	2462198.89	1028524.21	Confirmational
M54-S	08/04/11	1	2	ND	2462200.07	1028528.78	Confirmational
M55	07/26/11	1	1	134	2462192.57	1028511.88	Confirmational
M56	07/25/11	1	1	43	2462184.75	1028501.04	Confirmational
M56-S	08/04/11	1	2	306	2462178.21	1028501.46	Confirmational
M57	07/25/11	1	1	75	2462174.06	1028488.90	Confirmational
M58	07/25/11	1	1	53	2462167.26	1028478.75	Confirmational
M59	07/15/11	1	1	520	2462159.50	1028462.83	Confirmational
M60	07/15/11	1	1	6	2462151.33	1028452.46	Confirmational
M60-S	08/03/11	1	2	ND	2462146.78	1028457.40	Confirmational
M61	07/15/11	1	1	6	2462144.78	1028442.90	Confirmational
M62	07/15/11	1	1	224	2462134.62	1028432.11	Confirmational
M63	07/15/11	1	1	7	2462128.77	1028422.20	Confirmational
M64	07/15/11	1	1	6	2462121.39	1028409.41	Confirmational
M65	07/15/11	1	1	73	2462110.61	1028394.66	Confirmational
M66	07/15/11	1	1	59	2462102.03	1028383.02	Confirmational
M67	07/15/11	1	1	9	2462096.23	1028372.12	Confirmational
M68	07/15/11	1	1	30	2462087.86	1028359.34	Confirmational
M69	07/25/11	1	1	222	2462075.03	1028350.16	Confirmational
M70	07/25/11	1	1	229	2462067.98	1028340.11	Confirmational
MM10	07/21/11	1	1	383	2462850.60	1028818.22	Confirmational
MM11	07/21/11	1	1	80	2462843.35	1028805.82	Confirmational

ft: feet
mg/kg: milligram per kilogram
ND: non-detect result

Table 6.1
Post Removal Soil Lead Data Summary (0-2 ft-bgs)

Location	Date Sampled	Sample Depth		Result	Location		Sample Purpose
		Top (ft)	Bottom (ft)	(mg/kg)	X	Y	
MM11-S	07/30/11	1	2	115	2462847.96	1028804.53	Confirmational
MM12	07/21/11	1	1	134	2462834.80	1028795.21	Confirmational
MM13	07/21/11	1	1	1,200	2462827.52	1028783.44	Confirmational
MM13-S	07/30/11	1	2	59	2462824.40	1028779.71	Confirmational
MM14-S	07/30/11	1	2	257	2462815.05	1028767.51	Confirmational
MM15	07/21/11	1	1	50	2462808.98	1028760.66	Confirmational
MM16-SN	07/30/11	1	2	50	2462808.49	1028756.59	Confirmational
MM16-SW	07/30/11	1	2	17	2462808.58	1028746.08	Confirmational
MM18	07/21/11	1	1	528	2462785.78	1028725.70	Confirmational
MM19	07/22/11	1	1	93	2462777.14	1028716.11	Confirmational
MM20	07/22/11	1	1	781	2462769.36	1028704.35	Confirmational
MM24-S	07/23/11	0	1	1,290	2462736.50	1028652.22	Confirmational
MM25	07/22/11	1	1	138	2462726.47	1028645.58	Confirmational
MM25-S	08/10/11	1	2	1,260	2462732.67	1028651.00	Confirmational
MM26	07/23/11	0	1	32	2462721.22	1028632.11	Confirmational
MM28	07/23/11	0	1	339	2462706.81	1028612.96	Confirmational
MM30	07/23/11	1	1	817	2462693.21	1028590.54	Confirmational
MM42	07/18/11	1	1	941	2462590.82	1028453.78	Confirmational
MM9	07/21/11	1	1	165	2462859.94	1028829.42	Confirmational
MW-01	02/25/00	1	1	410	2462004.83	1028117.46	Delineation
N29	07/14/11	0	1	799	2462410.15	1028797.81	Confirmational
N29	07/14/11	1	2	482	2462410.15	1028797.81	Confirmational
N29-S	08/04/11	0	1	722	2462416.37	1028800.28	Confirmational
N29-S	08/04/11	1	2	184	2462416.37	1028800.28	Confirmational
N30	07/14/11	2	2	286	2462403.37	1028787.78	Confirmational
N30-S	07/14/11	1	2	575	2462399.32	1028793.53	Confirmational
N30-S	07/14/11	0	1	528	2462399.32	1028793.53	Confirmational
N31	07/14/11	2	2	645	2462398.74	1028781.69	Confirmational
N31-SS	07/14/11	1	2	437	2462394.87	1028777.26	Confirmational
N31-SS	07/14/11	0	1	408	2462394.87	1028777.26	Confirmational
N31-SW	07/14/11	1	1	895	2462393.78	1028785.46	Confirmational
N31-SW	07/14/11	1	2	474	2462393.78	1028785.46	Confirmational
N44	07/27/11	1	1	783	2462294.94	1028626.69	Confirmational
N44-S	07/27/11	0	1	733	2462290.52	1028628.46	Confirmational
N45	07/27/11	1	1	1,130	2462286.56	1028615.81	Confirmational
N46	07/27/11	1	1	675	2462278.88	1028604.75	Confirmational
N46-S	07/27/11	0	1	998	2462277.52	1028609.64	Confirmational
N52-S	08/04/11	0	1	386	2462223.08	1028532.96	Confirmational
N53	08/04/11	1	1	23	2462219.12	1028527.54	Confirmational
N54	07/26/11	0	1	606	2462204.56	1028514.86	Confirmational
N54-SN	08/04/11	0	1	25	2462213.38	1028519.22	Confirmational
N56	07/26/11	0	1	162	2462195.74	1028497.98	Confirmational
N57	07/26/11	0	1	ND	2462185.75	1028480.14	Confirmational
N58	08/03/11	0	1	834	2462175.71	1028462.49	Confirmational
N60	07/26/11	0	1	25	2462159.43	1028448.16	Confirmational
N61	07/26/11	0	1	39	2462147.51	1028432.57	Confirmational
N63	07/26/11	0	1	1,130	2462139.45	1028417.00	Confirmational
N66-2	08/03/11	1	1	21	2462113.44	1028375.52	Confirmational
N67	07/26/11	0	1	369	2462105.28	1028368.12	Confirmational
N67-SN	08/03/11	0	1	1,130	2462110.03	1028369.89	Confirmational
N68	07/26/11	0	1	330	2462093.48	1028351.71	Confirmational
NN10	07/21/11	1	1	542	2462861.33	1028810.16	Confirmational
NN11-S	07/30/11	1	2	81	2462850.79	1028794.57	Confirmational
NN12	07/21/11	1	1	169	2462846.38	1028786.53	Confirmational
NN13	07/21/11	1	1	429	2462837.64	1028776.42	Confirmational
NN14	07/21/11	1	1	52	2462830.42	1028763.44	Confirmational
NN14-S	07/30/11	1	2	14	2462825.76	1028768.29	Confirmational
NN15	07/21/11	1	1	1,260	2462820.71	1028751.52	Confirmational
NN15-S	08/10/11	1	2	109	2462819.60	1028748.80	Confirmational
NN16	07/21/11	1	1	645	2462812.94	1028739.58	Confirmational
NN17	07/21/11	1	1	202	2462804.93	1028729.90	Confirmational
NN17-S	08/10/11	1	2	432	2462809.33	1028733.12	Confirmational
NN18	07/21/11	1	1	241	2462798.04	1028716.49	Confirmational

ft: feet
mg/kg: milligram per kilogram
ND: non-detect result

Table 6.1
Post Removal Soil Lead Data Summary (0-2 ft-bgs)

Location	Date Sampled	Sample Depth		Result	Location		Sample Purpose
		Top (ft)	Bottom (ft)	(mg/kg)	X	Y	
NN18-S	07/30/11	1	2	138	2462800.20	1028715.07	Confirmational
NN19	07/22/11	1	1	190	2462790.80	1028706.69	Confirmational
NN19-S	08/10/11	1	2	863	2462793.19	1028701.99	Confirmational
NN20	07/22/11	1	1	170	2462781.68	1028695.95	Confirmational
NN20-S	08/16/11	0	1	294	2462781.17	1028679.96	Confirmational
NN21	07/22/11	1	1	229	2462775.20	1028684.43	Confirmational
NN22	07/22/11	1	1	296	2462762.26	1028672.13	Confirmational
NN25	07/30/11	0	1	23	2462744.50	1028645.23	Confirmational
NN25-SE	08/10/11	0	1	141	2462748.19	1028634.89	Confirmational
NN26-S	08/13/11	0	1	97	2462740.30	1028611.48	Confirmational
NN9	07/21/11	1	1	344	2462867.09	1028820.34	Confirmational
NN9-SP	08/13/11	0	1	519	2462772.81	1028730.42	Confirmational
O27-S	08/16/11	0	1	144	2462197.93	1028592.61	Confirmational
O28-S	08/04/11	1	2	500	2462428.20	1028799.68	Confirmational
O28-S	08/04/11	0	1	286	2462428.20	1028799.68	Confirmational
O28-SE	08/16/11	1	2	59	2462441.49	1028796.68	Confirmational
O28-SE	08/11/11	0	1	46	2462441.49	1028796.68	Confirmational
O30	07/14/11	2	2	94	2462416.69	1028782.44	Confirmational
O31	07/14/11	2	2	424	2462406.92	1028770.38	Confirmational
O44	07/27/11	1	1	152	2462302.23	1028621.65	Confirmational
O44-S	07/27/11	0	1	638	2462308.98	1028624.71	Confirmational
O45-SE	08/04/11	1	2	812	2462299.83	1028606.84	Confirmational
O45-SN	08/04/11	1	2	33	2462297.64	1028615.66	Confirmational
O45-SS	08/04/11	1	2	472	2462289.71	1028604.52	Confirmational
O45-SW	08/04/11	1	2	416	2462289.17	1028613.94	Confirmational
O46	07/27/11	1	1	906	2462288.52	1028598.82	Confirmational
O46-S	07/27/11	0	1	855	2462285.59	1028594.23	Confirmational
O53-S	08/04/11	0	1	862	2462226.93	1028520.16	Confirmational
O56-S	08/11/11	0	1	873	2462222.13	1028485.18	Confirmational
O59	08/03/11	0	1	1,250	2462178.60	1028451.39	Confirmational
O63	07/25/11	0	2	77	2462143.03	1028400.86	Confirmational
O64	07/25/11	0	2	1,130	2462132.95	1028386.68	Confirmational
O65-S	08/31/11	0	1	57	2462129.47	1028374.84	Confirmational
O66-2	08/31/11	1	1	25	2462125.63	1028368.99	Confirmational
O67-S	08/31/11	0	1	18	2462121.16	1028363.28	Confirmational
OO10-SP	08/13/11	0	1	8,020	2462875.34	1028821.69	Confirmational
OO11	07/30/11	1	2	12	2462862.17	1028793.92	Confirmational
OO12	07/21/11	1	1	34	2462859.12	1028778.95	Confirmational
OO13	07/21/11	1	1	128	2462850.29	1028766.35	Confirmational
OO14	07/21/11	1	1	60	2462840.41	1028755.75	Confirmational
OO15	07/21/11	1	1	37	2462833.53	1028742.77	Confirmational
OO16	07/21/11	1	1	251	2462824.94	1028732.94	Confirmational
OO16-S	08/10/11	1	2	141	2462822.56	1028736.20	Confirmational
OO17	07/21/11	1	1	74	2462817.87	1028720.92	Confirmational
OO17-S	07/30/11	1	2	457	2462821.70	1028718.20	Confirmational
OO19	07/22/11	1	1	703	2462799.43	1028700.49	Confirmational
OO20-S	08/10/11	1	2	141	2462797.73	1028690.71	Confirmational
OO21	07/22/11	1	1	1,160	2462786.98	1028676.08	Confirmational
OO21-S	08/16/11	1	2	97	2462787.22	1028613.57	Confirmational
OO24	08/01/11	1	1	76	2462765.13	1028622.89	Confirmational
OO24-2	08/10/11	1	1	851	2462759.89	1028641.24	Confirmational
OO24-S	08/01/11	0	1	523	2462759.61	1028626.69	Confirmational
OO24-SN	08/10/11	0	1	903	2462764.75	1028646.45	Confirmational
OO25	08/01/11	1	1	295	2462758.03	1028609.54	Confirmational
OO25-2	08/10/11	1	1	487	2462754.46	1028631.06	Confirmational
OO25-S	08/01/11	0	1	318	2462752.67	1028613.65	Confirmational
OO26	08/01/11	1	1	169	2462749.56	1028597.70	Confirmational
OO26-2	08/13/11	1	1	161	2462780.39	1028618.26	Confirmational
OO26-S	08/01/11	0	1	364	2462744.25	1028601.33	Confirmational
OO27	08/01/11	1	1	189	2462742.58	1028587.32	Confirmational
OO27-S	08/01/11	0	1	108	2462736.87	1028590.14	Confirmational
OO27-S2	08/13/11	0	1	173	2462745.60	1028619.84	Confirmational
P26-S	08/16/11	0	1	205	2462449.81	1028808.90	Confirmational

ft: feet
mg/kg: milligram per kilogram
ND: non-detect result

Table 6.1
Post Removal Soil Lead Data Summary (0-2 ft-bgs)

Location	Date Sampled	Sample Depth		Result	Location		Sample Purpose
		Top (ft)	Bottom (ft)	(mg/kg)	X	Y	
P27	08/16/11	1	1	91	2462442.29	1028813.18	Confirmational
P27-S	08/16/11	1	2	12	2462611.78	1028559.14	Confirmational
P28-S	08/04/11	1	2	61	2462437.73	1028792.61	Confirmational
P30	07/14/11	0	1	1,290	2462421.68	1028772.10	Confirmational
P30	07/14/11	1	2	1,080	2462421.68	1028772.10	Confirmational
P31	07/14/11	0	1	987	2462409.26	1028761.16	Confirmational
P31	07/14/11	1	2	395	2462409.26	1028761.16	Confirmational
P55-S2	08/11/11	0	1	797	2462182.86	1028587.22	Confirmational
P57-S	08/11/11	0	1	813	2462210.55	1028483.04	Confirmational
P59-S	08/04/11	0	1	908	2462196.41	1028442.17	Confirmational
P66-S	08/31/11	0	1	43	2462131.10	1028364.91	Confirmational
PP12	07/23/11	0	1	65	2462866.58	1028768.70	Confirmational
PP13	07/21/11	1	1	58	2462860.50	1028758.54	Confirmational
PP14	07/21/11	1	1	61	2462853.30	1028748.74	Confirmational
PP15	07/21/11	1	1	738	2462845.32	1028735.37	Confirmational
PP16	07/21/11	1	1	1,110	2462839.04	1028722.50	Confirmational
PP16-S	07/30/11	1	2	940	2462834.31	1028721.75	Confirmational
PP19	07/30/11	1	2	22	2462816.21	1028696.23	Confirmational
PP19-S	07/22/11	1	1	166	2462810.83	1028692.10	Confirmational
PP19-SW	08/10/11	1	2	130	2462808.80	1028693.70	Confirmational
PP21	07/22/11	1	1	307	2462796.66	1028669.12	Confirmational
PP22-S	07/30/11	0	1	1,220	2462773.48	1028649.11	Confirmational
PP24	08/01/11	0	1	53	2462775.35	1028614.83	Confirmational
PP25	08/01/11	0	1	459	2462768.34	1028603.05	Confirmational
PP26	08/01/11	0	1	83	2462761.76	1028591.21	Confirmational
PP27	08/01/11	0	1	101	2462754.46	1028579.67	Confirmational
Q46	07/27/11	0	1	1,120	2462305.14	1028580.27	Confirmational
Q47	07/27/11	0	1	575	2462300.93	1028565.83	Confirmational
Q49	07/27/11	0	1	400	2462290.02	1028546.28	Confirmational
Q50	07/27/11	0	1	85	2462280.30	1028530.62	Confirmational
Q51	07/16/11	0	1	508	2462275.34	1028521.15	Confirmational
Q53	07/16/11	0	1	35	2462262.52	1028503.42	Confirmational
Q54	07/27/11	0	1	299	2462251.07	1028491.21	Confirmational
Q55	07/27/11	0	1	498	2462241.85	1028481.39	Confirmational
Q55-S	08/04/11	0	1	1,130	2462230.33	1028479.66	Confirmational
Q57	07/27/11	0	1	1,060	2462215.38	1028452.98	Confirmational
Q57-SN	08/04/11	0	1	539	2462219.30	1028464.97	Confirmational
Q58-S	08/04/11	0	1	240	2462206.84	1028446.35	Confirmational
Q60-S	08/11/11	0	1	410	2462212.83	1028469.01	Confirmational
QQ14	07/23/11	0	1	15	2462863.07	1028738.89	Confirmational
QQ16	07/23/11	0	1	176	2462850.41	1028721.52	Confirmational
QQ17	07/23/11	0	1	419	2462838.23	1028704.98	Confirmational
QQ19	07/23/11	0	1	390	2462828.64	1028686.56	Confirmational
QQ20	07/23/11	0	1	518	2462818.23	1028670.95	Confirmational
QQ21	07/23/11	1	1	715	2462807.05	1028659.48	Confirmational
QQ21-S	07/30/11	1	2	805	2462805.01	1028655.75	Confirmational
QQ25-S	08/13/11	1	2	107	2462809.11	1028641.18	Confirmational
R46	07/27/11	1	1	1,010	2462318.76	1028572.35	Confirmational
R47	07/27/11	1	1	415	2462312.22	1028563.47	Confirmational
R48	07/27/11	1	1	1,230	2462305.12	1028549.09	Confirmational
R49	07/27/11	1	1	137	2462295.95	1028540.18	Confirmational
R50	07/27/11	1	1	97	2462289.96	1028530.18	Confirmational
R51	07/16/11	1	1	153	2462282.40	1028518.34	Confirmational
R52	07/16/11	1	1	36	2462274.72	1028506.80	Confirmational
R53	07/16/11	1	1	9	2462264.76	1028494.42	Confirmational
R54	07/16/11	1	1	13	2462257.32	1028486.28	Confirmational
R55	07/27/11	1	1	318	2462248.81	1028471.96	Confirmational
R56	07/27/11	1	1	129	2462241.31	1028461.28	Confirmational
R57	07/27/11	1	1	325	2462232.11	1028448.30	Confirmational
R58	07/27/11	1	1	44	2462223.23	1028438.60	Confirmational
R60	08/11/11	1	1	151	2462204.51	1028421.28	Confirmational
R60-S	08/11/11	0	1	57	2462210.14	1028418.20	Confirmational
RR21-SR	08/13/11	0	1	4,070	2462876.07	1028806.81	Confirmational

ft: feet
mg/kg: milligram per kilogram
ND: non-detect result

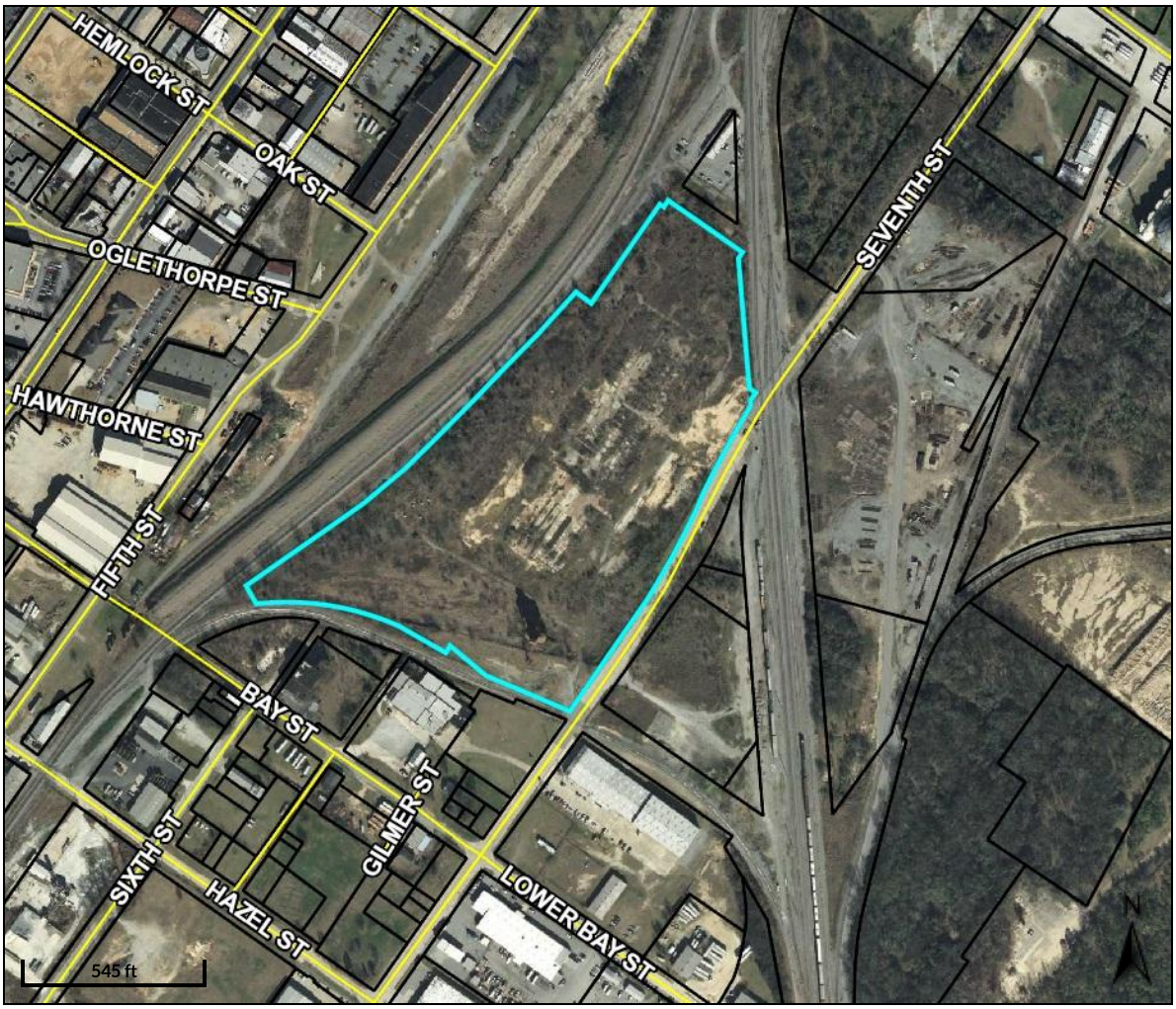
Table 6.1
Post Removal Soil Lead Data Summary (0-2 ft-bgs)

Location	Date Sampled	Sample Depth		Result	Location		Sample Purpose
		Top (ft)	Bottom (ft)	(mg/kg)	X	Y	
RR22-SR	08/13/11	0	1	3,110	2462816.25	1028652.99	Confirmational
RR23-S	08/16/11	0	1	130	2462454.96	1028815.01	Confirmational
RR24-S	08/16/11	0	1	59	2462797.29	1028626.82	Confirmational
RR25-S	08/16/11	0	1	461	2462793.91	1028617.29	Confirmational
S47	07/27/11	1	1	13	2462323.01	1028554.12	Confirmational
S48	07/27/11	1	1	45	2462316.34	1028543.60	Confirmational
S49	07/27/11	1	1	24	2462308.39	1028529.96	Confirmational
S50	07/27/11	1	1	86	2462301.36	1028519.66	Confirmational
S51	07/16/11	1	1	15	2462289.88	1028510.98	Confirmational
S52	07/16/11	1	1	20	2462283.99	1028500.65	Confirmational
S53	07/16/11	1	1	9	2462273.38	1028489.27	Confirmational
S54	07/16/11	1	1	153	2462267.59	1028478.39	Confirmational
S55	07/27/11	1	1	83	2462260.63	1028462.67	Confirmational
S56	07/27/11	1	1	112	2462252.14	1028451.05	Confirmational
S57	07/27/11	1	1	48	2462243.57	1028439.44	Confirmational
S57-S	08/04/11	1	2	5	2462248.55	1028439.40	Confirmational
S58	07/27/11	1	1	32	2462237.41	1028429.89	Confirmational
S59	07/27/11	1	1	101	2462229.40	1028418.85	Confirmational
S59-S	07/27/11	0	1	516	2462230.15	1028410.19	Confirmational
S64	07/15/11	1	1	ND	2462189.63	1028356.00	Confirmational
S65	07/15/11	1	1	254	2462178.94	1028346.75	Confirmational
S66	07/15/11	0	1	202	2462173.35	1028341.02	Confirmational
SD-01	06/22/00	1	1	577	2462281.98	1028626.66	Delineation
SD-04	06/16/00	1	1	167	2462395.35	1028786.34	Delineation
SD-05	06/20/00	1	1	206	2462391.27	1028864.79	Delineation
T46	07/27/11	1	1	779	2462341.74	1028557.67	Confirmational
T47	07/27/11	1	1	311	2462332.36	1028547.14	Confirmational
T48	07/27/11	1	1	47	2462325.35	1028536.74	Confirmational
T49	07/27/11	1	1	63	2462318.73	1028525.49	Confirmational
T50	07/27/11	1	1	99	2462310.16	1028513.24	Confirmational
T51	07/26/11	1	2	6	2462298.81	1028502.74	Confirmational
T55	07/27/11	1	1	71	2462269.54	1028456.84	Confirmational
T56	07/27/11	1	1	67	2462260.73	1028444.86	Confirmational
T56-S	08/04/11	1	2	33	2462258.11	1028443.19	Confirmational
T58	07/27/11	1	1	16	2462245.72	1028422.65	Confirmational
T58-S	08/04/11	1	2	9	2462247.78	1028428.42	Confirmational
T59	07/27/11	1	1	110	2462237.13	1028412.69	Confirmational
T65	07/15/11	1	1	618	2462189.53	1028339.09	Confirmational
TW-05	06/12/00	1	1	44	2462078.37	1028130.38	Delineation
TW-06	06/12/00	1	1	15	2462153.27	1027972.93	Delineation
U65	07/15/11	1	1	586	2462199.96	1028331.69	Confirmational
U66	07/15/11	0	1	657	2462193.89	1028328.90	Confirmational
V65	07/15/11	1	1	334	2462213.65	1028322.85	Confirmational
V66-SW	08/09/11	1	2	519	2462201.73	1028317.75	Confirmational
V66-SW	08/09/11	0	1	433	2462201.73	1028317.75	Confirmational
V67-S	07/22/11	0	1	511	2462202.55	1028304.50	Confirmational
V67-S	08/09/11	1	2	ND	2462202.55	1028304.50	Confirmational
W65	07/15/11	1	1	226	2462225.49	1028313.77	Confirmational
W67	08/01/11	1	1	340	2462218.33	1028304.99	Confirmational
W67-S	08/09/11	1	2	ND	2462215.83	1028305.21	Confirmational
X65	07/15/11	1	1	304	2462237.13	1028304.90	Confirmational
X66	07/15/11	0	1	248	2462229.02	1028299.71	Confirmational
X67	08/01/11	1	1	38	2462229.82	1028297.54	Confirmational
X67-S	07/22/11	0	1	560	2462222.51	1028287.20	Confirmational
Y65	07/15/11	1	1	184	2462247.48	1028298.67	Confirmational
Y67	08/01/11	1	1	22	2462239.46	1028288.41	Confirmational
Z65	07/15/11	1	1	65	2462259.56	1028289.64	Confirmational
Z67	08/01/11	1	1	23	2462252.22	1028279.75	Confirmational
Z67-S	07/22/11	0	1	301	2462240.71	1028274.67	Confirmational

ft: feet
mg/kg: milligram per kilogram
ND: non-detect result

APPENDIX A
VRP Property Identification

qPublic.net™ Bibb County, GA



Overview

Legend

Parcels

Roads

Parcel ID	R0810091OC 79	**Owner**	TRANSCO INC	**Last 2 Sales**			
Class Code	Industrial		200 N LASALLE ST STE 1550	**Date**	**Price**	**Reason**	**Qual**
Taxing District	MACON-BIBB		CHICAGO IL 60601	5/11/1992	$100	CP	U
	MACON-BIBB	**Physical Address**	861 SEVENTH ST	n/a	0	n/a	n/a
Acres	22.52	**Assessed Value**	Value $366052				

(Note: Not to be used on legal documents)

Date created: 2/25/2019
Last Data Uploaded: 2/25/2019 12:45:00 AM

Developed by Schneider GEOSPATIAL

CEF for 05-1555

BOOK 2134 PAGE 344

Pd

BILL & RETURN
SELL & MELTON
P.O. BOX 229
MACON, GA 31297

SELL & MELTON
ATTORNEYS AT LAW
1414 CHARTER MEDICAL BUILDING
MACON, GEORGIA 31297

80494

STATE OF GEORGIA
COUNTY OF BIBB

THIS INDENTURE, made this 11th day of May

in the year of our Lord one Thousand Nine Hundred and Ninety-Two

between

MACON-BIBB COUNTY INDUSTRIAL AUTHORITY of the State of Georgia and County of Bibb hereinafter called the "first party," and

TRANSCO INC. of the State of Georgia and County of Bibb hereinafter called the "second party,"

WITNESSETH: That the first party, for and in consideration of the sum of Other good and valuable considerations and One Hundred and No/100 ---------- ($ 100.00) Dollars, cash in hand paid at and before the sealing and delivery of these presents, the receipt whereof is hereby acknowledged, does by these presents, grant, bargain, sell convey and confirm unto the second party, all that tract or parcel of land, lying and being in

See Exhibit "A" attached hereto and made a part hereof.

This Deed is made pursuant to an Option contained in an Agreement between the parties dated March 1, 1980, which is recorded in Deed Book 1379, Page 635, Clerk's Office, Bibb Superior Court.

RECEIVED
CLERK'S OFFICE
1992 MAY 12 AM 10 39
SUPERIOR COURT OF
BIBB COUNTY, GEORGIA

TO HAVE AND TO HOLD the said bargained premises, together with all and singular the rights, members and appurtenances thereunto belonging or in any wise appertaining, to every proper use, benefit and behoof of the second party, his, her, or its heirs, executors, administrators and assigns in FEE SIMPLE;

And the first party, his, her, or its heirs, executors, administrators, will warrant and forever defend the right and title to the above described property unto the second party, his, her or its heirs, executors, administrators and assigns, against the lawful claims and demands of all persons ~~whomsoever~~ claiming under first party.

IN WITNESS WHEREOF, the first party has signed, sealed and delivered these presents, the day and year first above written.

Signed, sealed and delivered in the presence of:

Jean C. Nagelstein

Jean P. Rheene
Notary Public, Bibb County, Georgia
MY COMMISSION EXPIRES APRIL 5, 1993

MACON-BIBB COUNTY INDUSTRIAL AUTHORITY (SEAL)

By: Chairman (SEAL)

Attest: (SEAL)

GEORGIA, Bibb County, Clerk's Office Superior Court
Filed for Record MAY 12 1992 at 10:39a M
Recorded MAY 13 1992
Vivian B Cowan Dep. Clerk

WARRANTY DEED

GEORGIA, Bibb COUNTY

CLERK'S OFFICE, SUPERIOR COURT

Filed for Record at 10:39 o'clock A M.

MAY 12 1992, 19

Recorded in Deed Book BOOK 2134 PAGE Folio 344

MAY 13 1992, 19

Vivian S Cowan Dep. CLERK

SELL & MELTON
ATTORNEYS AT LAW
1414 CHARTER MEDICAL BUILDING
MACON, GEORGIA 31297

EXHIBIT A

DESCRIPTION OF THE REAL ESTATE

All that tract or parcel of land situate, lying and being in the City of Macon, Bibb County, Georgia, and being part of Old City Square 80, Lots 1 and 2 of the South Western Range of two Acre Lots, Blocks 1 and 11 of Southwest Commons, and parts of Blocks 2, 10 and 12 of Southwest Commons and various closed streets, and being more particularly described as follows: to wit,

COMMENCING at an existing center stone located at the centerline intersection of Sixth Street and Hazel Street and running thence, North 35°-00'East, a distance of 517.0 feet; thence, North 4°-19'-30" West, a distance of 269.25 feet to a point, said point being the POINT OF BEGINNING: from this POINT OF BEGINNING running thence, North 29°-10' West, crossing a spur track and three other spur tracks, a distance of 59.8 feet; thence, North 55°-00'-30" East a distance of 280.4 feet; thence, North 54°-52'East, a distance of 134.05 feet; thence, North 50°-01' East, a distance of 155.55 feet; thence South 75°-25' East, a distance of 190.55 feet; thence North 14°-35'East, a distance of 323.0 feet; thence, North 43°-44'-30" East, a distance of 67.35 feet, thence, North 44°-35'-15" East, a distance of 123.95 feet; thence, North 42°-00' East, a distance of 163.9 feet; thence, South 53°-01'-15" East, a distance of 55.1 feet; thence, North 34°-40' East, a distance of 347.4 feet; thence, South 56°-37'-30" East, a distance of 14.6 feet; thence, North 31°-13' East, a distance of 22.45 feet; thence, South 55°-04' East, a distance of 261.4 feet, more or less, to the northeasterly corner of the Old Blacksmith Shop Building; thence, South 34°-47' West, along the southeasterly side of said Blacksmith Shop Building, a distance of 20.6 feet; thence, South 04°-46'-15" East, a distance of 376.3 feet, more or less, to the northeasterly side of a building known as a sheet metal building; thence South 55°-03'-15" East, along said northeasterly side of said sheet metal building, a distance of 22.3 feet; thence, South 34°-56'-45" West, along the southeasterly side of said sheet metal building, a distance of 26.8 feet; thence, South 04°-46'-15" East, a distance of 14.9 feet, more or less, to a point on the northwesterly right-of-way boundary of Seventh Street; thence, southwardly along a curve to the left (chord - South 28°-32' West, 286.9 feet) an arc distance of 287.4 feet; thence South 22°-32' West, a distance of 51.7 feet; thence continuing southwardly along a curve to the right (chord - South 28°-35" West, 289.3 feet) an arc distance of 289.8 feet; thence, South 34°-38' West, a distance of 397.4 feet, more or less to a point, said point being on the westerly right-of-way boundary of Seventh Street, said point also being 25 feet northwardly from, as measured at a right angle to, the centerline of the track designated and known as the Dooley track, and running thence, North 66°-55'-45" West, along a line that is parallel to and at all points 25 feet northwardly from, as measured at right angles to, said centerline of said Dooley track, a distance of 262.8 feet, more or less, to a point that is 12 feet northeastwardly from, as measured at a right angle to, a spur track; thence, North 60°-13' West, along a line that is parallel to and at all points 12 feet Northeastwardly from, as measured at right angles to, said spur track, a distance of 134.65 feet; thence, South 29°-47' West, crossing said spur track, a distance of 24 feet, more or less, to a point that is 12 feet Southwestwardly from, as measured at a right angle to, said spur track; thence, North 60°-13' West, along a line that is parallel to and at all points 12 feet Southwestwardly from said spur track, a distance of 154.4 feet; thence, Northwestwardly along a curve to the left, along an arc that is

parallel to and at all points 12 feet southwestwardly from said spur track (chord - North 80°-34'-15" West, 421.7 feet) an arc distance of 434.2 feet, more or less, to the POINT OF BEGINNING, and being subject to that small increment or area being occupied by Seventh Street, containing 21.83 acres, more or less. Said parcel being shown as Parcel "B" on a plat of survey by S. J. Gostin Co., Inc., dated November 8, 1979, revised January 14, 1980.

TOGETHER WITH:

ALL that tract or parcel of land situate, lying and being in the City of Macon, Bibb County, Georgia, and being part of Original Lot 3, of the South Western Range of 2 acre lots, and being more particularly described as follows: to wit,

BEGINNING at a point on the northerly right-of-way boundary of Hawthorne Street (an unopened street), said point being a common property corner between property owned by Central of Georgia Railroad Company, and property being owned by The South Western Railroad Company, and running thence, North 75°-25' West, along the common property boundary of property owned by the Central of Georgia Railroad Company and property owned by The South Western Railroad Company, a distance of 190.55 feet; thence, North 50°-01' East, a distance of 22.95 feet, thence, North 45°-29'-45" East, a distance of 110.75 feet; thence, North 44°-46' East, a distance of 174.35 feet; thence, North 43°-44'-30" East, a distance of 67.05 feet; thence, South 14°-35' West, a distance of 323 feet, more or less, to the POINT OF BEGINNING; containing 0.69 of an acre, more or less. Said parcel being shown as Parcel "A" on a plat of survey by S. J. Gostin Co., Inc., dated November 8, 1979, revised January 14, 1980.

TOGETHER with any and all right, title and interest of GRANTOR in and to any adjacent streets, alleys and rights-of-way; and any and all right, title and interest of GRANTOR in and to the improvements located on said premises, including, but not limited to, the portions of tracks located on above-described property, including all the rails, materials and fixtures in or appurtenant thereto, as is located upon and within the boundaries of the property herein conveyed, together with those portions of track (the "tail track") adjoining the above-described property, between survey stations 1+81 and 2+87; between survey stations 8+74 and 12+52; and those portions of tracks springing from aforesaid track between survey stations 12+52 to the westerly boundary of above-described property, together with the right to maintain and use the aforementioned portions of tail track for so long as Transco, its successors and assigns shall require the same.

GEORGIA, Bibb County, Clerk's Office Superior Court
Filed for Record MAY 12 1992 at 10:39 AM
Recorded MAY 13 1992
Dep. Clerk

This STATEMENT is presented to a filing officer for filing pursuant to the Uniform Commercial Code.

(For Filing Officer Only)
File Number:
Time: 11:40 AM
Date: 5-4-82
BBBB County, Georgia, Office of Clerk Superior Courts

1 Debtor(s) (Last Name-First) and address(es)
Macon-Bibb County Industrial Authority
305 Coliseum Drive
P. O. Box 207
Macon, Georgia 31202

2 Secured Party(ies) and address(es)
Harris Trust and Savings Bank
111 West Monroe Street
Chicago, Illinois 60690

IMPORTANT - COMPLETE THIS BOX
Maturity Date n/a
If none state so

This statement refers to original Financing Statement No. 156246 Filed on (date): April 9, 1980

A. Continuation . . . . ☐
The original financing statement between the foregoing Debtor and Secured Party, bearing the file number shown above, is still effective.

B. Partial Release . . . ☐
From the collateral described in the financing statement bearing the file number shown above, the Secured Party releases the following:

C. Assignment . . . . . ☐
The Secured Party certifies that the Secured Party has assigned to the Assignee (whose name and address is shown below) Secured Party's rights under the financing statement bearing the file number shown above in the following property:

D. Other . . . . . ☒
Termination*

*Secured party no longer claims a security interest under the financing statement bearing file number shown above.

Harris Trust and Savings Bank

By: _____
Signature(s) of Debtor(s)

By: Donald Walk AVP
(Signature of Secured Party)

Filing Officer Copy

252831

APPENDIX B
Professional Geologist Summary of Hours

Appendix B
Professional Geologist Hours
Period: September 2018 through March 2019

Period	Hours
September 2018	1.5
October 2018	1
November 2018	1
December 2018	3
January 2019	0
February 2019	0
March 2019	4
Total:	10.5

APPENDIX C
Milestone Schedule

Appendix C
Project Milestone Schedule
Former Transco Railyard, GA HSI Site

			Year 1		Year 2		Year 3		Year 4		Year 5	
			6mo	12mo	18mo	24mo	30mo	36mo	42mo	48mo	54mo	60mo
ID	**Task Name**		Feb-19	Aug-19	Feb-20	Aug-20	Feb-21	Aug-21	Feb-22	Aug-22	Feb-23	Aug-23
1	VIRP Approval	Aug-18										
2	Semi-Annual Progress Reports											
3	Enter Qualifying Properties											
4	Source Area Investigation / Soil Delineation											
5	On-site Horizontal Groundwater Delineation											
6	Off-site Horizontal Groundwater Delineation (if necessary)											
7	Vertical Groundwater Delineation (if necessary)											
8	Updated CSM and Final Remdiation Plan											
9	Remedial Activities											
10	Compliance Status Report											

APPENDIX D
Draft Environmental Covenant

APPENDIX E
Laboratory Analytical Reports

AES

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

January 28, 2019

Aaron Williams
Environmental Planning Specialists, Inc.

1050 Crown Pointe Parkway
Atlanta GA 30338

RE: Transco

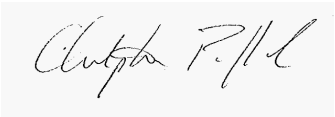
Dear Aaron Williams: Order No: 1901I45

Analytical Environmental Services, Inc. received 6 samples on January 22, 2019 3:00 pm for the analyses presented in following report.

No problems were encountered during the analyses. Additionally, all results for the associated Quality Control samples were within EPA and/or AES established limits. Any discrepancies associated with the analyses contained herein will be noted and submitted in the form of a project Case Narrative.
AES's accreditations are as follows:
-NELAP/State of Florida Laboratory ID E87582 for analysis of Non-Potable Water, Solid & Chemical Materials, Air & Emissions Volatile Organics, and Drinking Water Microbiology & Metals, effective 07/01/18-06/30/19.
State of Georgia, Department of Natural Resources ID #800 for analysis of Drinking Water Metals, effective 07/01/18-06/30/19 and Total Coliforms/ E. coli, effective 04/25/17-04/24/20.
-AIHA-LAP, LLC Laboratory ID: 100671 for Industrial Hygiene samples (Organics, Metals, PCM Asbestos, Gravimetric), Environmental Lead (Paint, Soil, Dust Wipes, Air), and Environmental Microbiology (Fungal) Direct Examination, effective until 11/01/19.
These results relate only to the items tested. This report may only be reproduced in full.

If you have any questions regarding these test results, please feel free to call.

Sincerely,



Chris Pafford

Project Manager

3080 Presidential Drive • Atlanta, Georgia 30340 • Tel: 770.457.8177 • Fax: 770.457.8188 • Toll Free: 800.972.4889
www.aesatlanta.com

ANALYTICAL ENVIRONMENTAL SERVICES, INC.
3080 Presidential Drive Atlanta, GA 30340-3704
AES Phone: (770) 457-8177 / Toll-Free: (800) 972-4889 / Fax: (770) 457-8188

CHAIN OF CUSTODY

Work Order: 1901345

Date: 1-22-19 Page 1 of 1

COMPANY: EPS

ADDRESS: 400 Northridge Rd, Ste 400 Sandy Springs, GA 30350

PHONE: 404-315-9113

EMAIL: awilliams@enplanning.com

SAMPLED BY: Joe Terry, Brian McGuinn

SIGNATURE: Joe Terry BM

#	SAMPLE ID	SAMPLED: DATE	SAMPLED: TIME	GRAB	COMPOSITE	MATRIX (see codes)	ANALYSIS REQUESTED: PAH SIM	PRESERVATION (see codes): I	REMARKS	Number of Containers
1	19022-MW-1	1-22-19	0950	X		GW	X	X		2
2	19022-TW-1	1-22-19	0920	X		GW	X	X		2
3	19022-TW-31	1-22-19	1115	X		GW	X	X		2
4	19022-TW-33	1-22-19	1125	X		GW	X	X		2
5	19022-TW-8	1-22-19	1255	X		GW	X	X		2
6	19022-Dup	1-22-19	1200	X		GW	X	X		2
7										
8										
9										
10										
11										
12										
13										
14										

Visit our website www.aesatlanta.com for downloadable COCs and to log in to your AESAccess account.

RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:	DATE/TIME:
1. Joe Terry	1-22-19/1500	1. JWJ	1-22-19 1500
2.		2.	
3.		3.	

SPECIAL INSTRUCTIONS/COMMENTS:

SHIPMENT METHOD

OUT: / / VIA:

IN: / / VIA:

client FedEx UPS US mail courier Greyhound

other: _____

PROJECT INFORMATION

PROJECT NAME: Transco

PROJECT #:

SITE ADDRESS: Macon, GA

SEND REPORT TO: Aaron Williams

INVOICE TO:
(IF DIFFERENT FROM ABOVE)

QUOTE #: _____ PO#: _____

RECEIPT

Total # of Containers

Turnaround Time (TAT) Request

- [x] Standard 5 Business Days
- [ ] 2 Business Day Rush
- [ ] Next Business Day Rush
- [ ] Same-Day Rush **(auth req.)**
- [x] Other EDD

STATE PROGRAM (if any): _____

E-mail? ☐ Fax? ☐

DATA PACKAGE: I ○ II ○ III ○ IV ○

Submission of samples to the laboratory constitutes acceptance of AES's Terms & Conditions. Samples received after 3PM or on Saturday are considered as received the following business day. If no TAT is marked on COC, AES will proceed with standard TAT. Samples are disposed of 30 days after completion of report unless other arangements are made.

Matrix Codes: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water WW = Waste Water W = Water (Blanks) DW = Drinking Water (Blanks) O = Other (specify)

Preservative Codes: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

White Copy - Original; Yellow Copy - Client

Analytical Environmental Services, Inc

Date: 25-Jan-19

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	19022-MW-1
Project Name:	Transco	**Collection Date:**	1/22/2019 9:50:00 AM
Lab ID:	1901I45-001	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
SIM Polynuclear Aromatic Hydrocarbons	**SW8270D**			**(SW3510C)**				
Naphthalene	BRL	0.50		ug/L	273370	1	01/23/2019 18:08	YH
1-Methylnaphthalene	BRL	0.50		ug/L	273370	1	01/23/2019 18:08	YH
2-Methylnaphthalene	BRL	0.50		ug/L	273370	1	01/23/2019 18:08	YH
Acenaphthylene	BRL	1.0		ug/L	273370	1	01/23/2019 18:08	YH
Acenaphthene	BRL	0.50		ug/L	273370	1	01/23/2019 18:08	YH
Fluorene	BRL	0.10		ug/L	273370	1	01/23/2019 18:08	YH
Phenanthrene	BRL	0.050		ug/L	273370	1	01/23/2019 18:08	YH
Anthracene	BRL	0.050		ug/L	273370	1	01/23/2019 18:08	YH
Fluoranthene	BRL	0.10		ug/L	273370	1	01/23/2019 18:08	YH
Pyrene	BRL	0.050		ug/L	273370	1	01/23/2019 18:08	YH
Benz(a)anthracene	BRL	0.050		ug/L	273370	1	01/23/2019 18:08	YH
Chrysene	BRL	0.050		ug/L	273370	1	01/23/2019 18:08	YH
Benzo(b)fluoranthene	BRL	0.10		ug/L	273370	1	01/23/2019 18:08	YH
Benzo(k)fluoranthene	BRL	0.050		ug/L	273370	1	01/23/2019 18:08	YH
Benzo(a)pyrene	BRL	0.050		ug/L	273370	1	01/23/2019 18:08	YH
Indeno(1,2,3-cd)pyrene	BRL	0.050		ug/L	273370	1	01/23/2019 18:08	YH
Dibenz(a,h)anthracene	BRL	0.10		ug/L	273370	1	01/23/2019 18:08	YH
Benzo(g,h,i)perylene	BRL	0.10		ug/L	273370	1	01/23/2019 18:08	YH
Surr: 4-Terphenyl-d14	121	69.4-138		%REC	273370	1	01/23/2019 18:08	YH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 25-Jan-19

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	19022-TW-1
Project Name:	Transco	**Collection Date:**	1/22/2019 9:20:00 AM
Lab ID:	1901I45-002	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
SIM Polynuclear Aromatic Hydrocarbons	**SW8270D**			**(SW3510C)**				
Naphthalene	BRL	0.50		ug/L	273370	1	01/23/2019 18:35	YH
1-Methylnaphthalene	BRL	0.50		ug/L	273370	1	01/23/2019 18:35	YH
2-Methylnaphthalene	BRL	0.50		ug/L	273370	1	01/23/2019 18:35	YH
Acenaphthylene	BRL	1.0		ug/L	273370	1	01/23/2019 18:35	YH
Acenaphthene	BRL	0.50		ug/L	273370	1	01/23/2019 18:35	YH
Fluorene	BRL	0.10		ug/L	273370	1	01/23/2019 18:35	YH
Phenanthrene	BRL	0.050		ug/L	273370	1	01/23/2019 18:35	YH
Anthracene	BRL	0.050		ug/L	273370	1	01/23/2019 18:35	YH
Fluoranthene	BRL	0.10		ug/L	273370	1	01/23/2019 18:35	YH
Pyrene	BRL	0.050		ug/L	273370	1	01/23/2019 18:35	YH
Benz(a)anthracene	BRL	0.050		ug/L	273370	1	01/23/2019 18:35	YH
Chrysene	BRL	0.050		ug/L	273370	1	01/23/2019 18:35	YH
Benzo(b)fluoranthene	BRL	0.10		ug/L	273370	1	01/23/2019 18:35	YH
Benzo(k)fluoranthene	BRL	0.050		ug/L	273370	1	01/23/2019 18:35	YH
Benzo(a)pyrene	BRL	0.050		ug/L	273370	1	01/23/2019 18:35	YH
Indeno(1,2,3-cd)pyrene	BRL	0.050		ug/L	273370	1	01/23/2019 18:35	YH
Dibenz(a,h)anthracene	BRL	0.10		ug/L	273370	1	01/23/2019 18:35	YH
Benzo(g,h,i)perylene	BRL	0.10		ug/L	273370	1	01/23/2019 18:35	YH
Surr: 4-Terphenyl-d14	70.2	69.4-138		%REC	273370	1	01/23/2019 18:35	YH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 25-Jan-19

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	19022-TW-31
Project Name:	Transco	**Collection Date:**	1/22/2019 11:15:00 AM
Lab ID:	1901I45-003	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
SIM Polynuclear Aromatic Hydrocarbons	**SW8270D**			**(SW3510C)**				
Naphthalene	BRL	0.50		ug/L	273370	1	01/23/2019 19:01	YH
1-Methylnaphthalene	BRL	0.50		ug/L	273370	1	01/23/2019 19:01	YH
2-Methylnaphthalene	BRL	0.50		ug/L	273370	1	01/23/2019 19:01	YH
Acenaphthylene	BRL	1.0		ug/L	273370	1	01/23/2019 19:01	YH
Acenaphthene	BRL	0.50		ug/L	273370	1	01/23/2019 19:01	YH
Fluorene	BRL	0.10		ug/L	273370	1	01/23/2019 19:01	YH
Phenanthrene	BRL	0.050		ug/L	273370	1	01/23/2019 19:01	YH
Anthracene	BRL	0.050		ug/L	273370	1	01/23/2019 19:01	YH
Fluoranthene	BRL	0.10		ug/L	273370	1	01/23/2019 19:01	YH
Pyrene	BRL	0.050		ug/L	273370	1	01/23/2019 19:01	YH
Benz(a)anthracene	BRL	0.050		ug/L	273370	1	01/23/2019 19:01	YH
Chrysene	BRL	0.050		ug/L	273370	1	01/23/2019 19:01	YH
Benzo(b)fluoranthene	BRL	0.10		ug/L	273370	1	01/23/2019 19:01	YH
Benzo(k)fluoranthene	BRL	0.050		ug/L	273370	1	01/23/2019 19:01	YH
Benzo(a)pyrene	BRL	0.050		ug/L	273370	1	01/23/2019 19:01	YH
Indeno(1,2,3-cd)pyrene	BRL	0.050		ug/L	273370	1	01/23/2019 19:01	YH
Dibenz(a,h)anthracene	BRL	0.10		ug/L	273370	1	01/23/2019 19:01	YH
Benzo(g,h,i)perylene	BRL	0.10		ug/L	273370	1	01/23/2019 19:01	YH
Surr: 4-Terphenyl-d14	106	69.4-138		%REC	273370	1	01/23/2019 19:01	YH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 25-Jan-19

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	19022-TW-33
Project Name:	Transco	**Collection Date:**	1/22/2019 11:25:00 AM
Lab ID:	1901I45-004	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
SIM Polynuclear Aromatic Hydrocarbons	**SW8270D**			**(SW3510C)**				
Naphthalene	0.92	0.50		ug/L	273370	1	01/23/2019 19:27	YH
1-Methylnaphthalene	3.2	0.50		ug/L	273370	1	01/23/2019 19:27	YH
2-Methylnaphthalene	BRL	0.50		ug/L	273370	1	01/23/2019 19:27	YH
Acenaphthylene	BRL	1.0		ug/L	273370	1	01/23/2019 19:27	YH
Acenaphthene	4.4	0.50		ug/L	273370	1	01/23/2019 19:27	YH
Fluorene	4.4	0.10		ug/L	273370	1	01/23/2019 19:27	YH
Phenanthrene	2.2	0.050		ug/L	273370	1	01/23/2019 19:27	YH
Anthracene	0.48	0.050		ug/L	273370	1	01/23/2019 19:27	YH
Fluoranthene	0.31	0.10		ug/L	273370	1	01/23/2019 19:27	YH
Pyrene	0.30	0.050		ug/L	273370	1	01/23/2019 19:27	YH
Benz(a)anthracene	0.25	0.050		ug/L	273370	1	01/23/2019 19:27	YH
Chrysene	0.22	0.050		ug/L	273370	1	01/23/2019 19:27	YH
Benzo(b)fluoranthene	0.31	0.10		ug/L	273370	1	01/23/2019 19:27	YH
Benzo(k)fluoranthene	0.20	0.050		ug/L	273370	1	01/23/2019 19:27	YH
Benzo(a)pyrene	0.22	0.050		ug/L	273370	1	01/23/2019 19:27	YH
Indeno(1,2,3-cd)pyrene	0.23	0.050		ug/L	273370	1	01/23/2019 19:27	YH
Dibenz(a,h)anthracene	0.18	0.10		ug/L	273370	1	01/23/2019 19:27	YH
Benzo(g,h,i)perylene	0.23	0.10		ug/L	273370	1	01/23/2019 19:27	YH
Surr: 4-Terphenyl-d14	118	69.4-138		%REC	273370	1	01/23/2019 19:27	YH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 25-Jan-19

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	19022-TW-8
Project Name:	Transco	**Collection Date:**	1/22/2019 12:55:00 PM
Lab ID:	1901I45-005	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
SIM Polynuclear Aromatic Hydrocarbons	**SW8270D**			**(SW3510C)**				
Naphthalene	BRL	0.50		ug/L	273370	1	01/23/2019 19:53	YH
1-Methylnaphthalene	BRL	0.50		ug/L	273370	1	01/23/2019 19:53	YH
2-Methylnaphthalene	BRL	0.50		ug/L	273370	1	01/23/2019 19:53	YH
Acenaphthylene	BRL	1.0		ug/L	273370	1	01/23/2019 19:53	YH
Acenaphthene	BRL	0.50		ug/L	273370	1	01/23/2019 19:53	YH
Fluorene	BRL	0.10		ug/L	273370	1	01/23/2019 19:53	YH
Phenanthrene	BRL	0.050		ug/L	273370	1	01/23/2019 19:53	YH
Anthracene	BRL	0.050		ug/L	273370	1	01/23/2019 19:53	YH
Fluoranthene	BRL	0.10		ug/L	273370	1	01/23/2019 19:53	YH
Pyrene	0.40	0.050		ug/L	273370	1	01/23/2019 19:53	YH
Benz(a)anthracene	BRL	0.050		ug/L	273370	1	01/23/2019 19:53	YH
Chrysene	BRL	0.050		ug/L	273370	1	01/23/2019 19:53	YH
Benzo(b)fluoranthene	BRL	0.10		ug/L	273370	1	01/23/2019 19:53	YH
Benzo(k)fluoranthene	BRL	0.050		ug/L	273370	1	01/23/2019 19:53	YH
Benzo(a)pyrene	BRL	0.050		ug/L	273370	1	01/23/2019 19:53	YH
Indeno(1,2,3-cd)pyrene	BRL	0.050		ug/L	273370	1	01/23/2019 19:53	YH
Dibenz(a,h)anthracene	BRL	0.10		ug/L	273370	1	01/23/2019 19:53	YH
Benzo(g,h,i)perylene	BRL	0.10		ug/L	273370	1	01/23/2019 19:53	YH
Surr: 4-Terphenyl-d14	121	69.4-138		%REC	273370	1	01/23/2019 19:53	YH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 25-Jan-19

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	19022-DUP
Project Name:	Transco	**Collection Date:**	1/22/2019 12:00:00 PM
Lab ID:	1901I45-006	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
SIM Polynuclear Aromatic Hydrocarbons	**SW8270D**			**(SW3510C)**				
Naphthalene	BRL	0.50		ug/L	273370	1	01/23/2019 16:47	YH
1-Methylnaphthalene	BRL	0.50		ug/L	273370	1	01/23/2019 16:47	YH
2-Methylnaphthalene	BRL	0.50		ug/L	273370	1	01/23/2019 16:47	YH
Acenaphthylene	BRL	1.0		ug/L	273370	1	01/23/2019 16:47	YH
Acenaphthene	BRL	0.50		ug/L	273370	1	01/23/2019 16:47	YH
Fluorene	BRL	0.10		ug/L	273370	1	01/23/2019 16:47	YH
Phenanthrene	BRL	0.050		ug/L	273370	1	01/23/2019 16:47	YH
Anthracene	BRL	0.050		ug/L	273370	1	01/23/2019 16:47	YH
Fluoranthene	BRL	0.10		ug/L	273370	1	01/23/2019 16:47	YH
Pyrene	BRL	0.050		ug/L	273370	1	01/23/2019 16:47	YH
Benz(a)anthracene	BRL	0.050		ug/L	273370	1	01/23/2019 16:47	YH
Chrysene	BRL	0.050		ug/L	273370	1	01/23/2019 16:47	YH
Benzo(b)fluoranthene	BRL	0.10		ug/L	273370	1	01/23/2019 16:47	YH
Benzo(k)fluoranthene	BRL	0.050		ug/L	273370	1	01/23/2019 16:47	YH
Benzo(a)pyrene	BRL	0.050		ug/L	273370	1	01/23/2019 16:47	YH
Indeno(1,2,3-cd)pyrene	BRL	0.050		ug/L	273370	1	01/23/2019 16:47	YH
Dibenz(a,h)anthracene	BRL	0.10		ug/L	273370	1	01/23/2019 16:47	YH
Benzo(g,h,i)perylene	BRL	0.10		ug/L	273370	1	01/23/2019 16:47	YH
Surr: 4-Terphenyl-d14	67.7	69.4-138	S	%REC	273370	1	01/23/2019 16:47	YH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Clear Save as

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

SAMPLE/COOLER RECEIPT CHECKLIST

1. Client Name: **Environmental Planning Specialists, Inc.** AES Work Order Number: **1901i45**

2. Carrier: FedEx ☐ UPS ☐ USPS ☐ Client ■ Courier ☐ Other _____

		Yes	No	N/A	Details	Comments
3.	Shipping container/cooler received in good condition?	●	○	○	damaged ☐ leaking ☐ other ☐	
4.	Custody seals present on shipping container?	●	○	○		
5.	Custody seals intact on shipping container?	●	○	○		
6.	Temperature blanks present?	●	○	○		
7.	Cooler temperature(s) within limits of 0-6°C? [See item 13 and 14 for temperature recordings.]	●	○	○	Cooling initiated for recently collected samples / ice present ☐	
8.	Chain of Custody (COC) present?	●	○	○		
9.	Chain of Custody signed, dated, and timed when relinquished and received?	●	○	○		
10.	Sampler name and/or signature on COC?	●	○	○		
11.	Were all samples received within holding time?	●	○	○		
12.	TAT marked on the COC?	●	○	○	If no TAT indicated, proceeded with standard TAT per Terms & Conditions. ☐	

13. Cooler 1 Temperature 1.3 °C Cooler 2 Temperature 1.6 °C Cooler 3 Temperature _____ °C Cooler 4 Temperature _____ °C

14. Cooler 5 Temperature _____ °C Cooler 6 Temperature _____ °C Cooler 7 Temperature _____ °C Cooler 8 Temperature _____ °C

15. Comments: _____

I certify that I have completed sections 1-15 (dated initials). MJ 1/22/19

		Yes	No	N/A	Details	Comments
16.	Were sample containers intact upon receipt?	●	○	○		
17.	Custody seals present on sample containers?	○	●	○		
18.	Custody seals intact on sample containers?	○	○	●		
19.	Do sample container labels match the COC?	●	○	○	incomplete info ☐ illegible ☐ no label ☐ other ☐	
20.	Are analyses requested indicated on the COC?	●	○	○		
21.	Were all of the samples listed on the COC received?	●	○	○	samples received but not listed on COC ☐ samples listed on COC not received ☐	
22.	Was the sample collection date/time noted?	●	○	○		
23.	Did we receive sufficient sample volume for indicated analyses?	●	○	○		
24.	Were samples received in appropriate containers?	●	○	○		
25.	Were VOA samples received without headspace (< 1/4" bubble)?	○	○	●		
26.	Were trip blanks submitted?	○	○	●	listed on COC ☐ not listed on COC ☐	

27. Comments: _____

I certify that I have completed sections 16-27 (dated initials). MJ 1/22/19

This section only applies to samples where pH can be checked at Sample Receipt.

		Yes	No	N/A	Details	Comments
28.	Have containers needing chemical preservation been checked? *	○	○	●		
29.	Containers meet preservation guidelines?	○	○	●		
30.	Was pH adjusted at Sample Receipt?	○	○	●		

* Note: Certain analyses require chemical preservation but must be checked in the laboratory and not upon Sample Receipt such as Coliforms, VOCs and Oil & Grease/TPH.

I certify that I have completed sections 28-30 (dated initials). MJ 1/22/19

Locked

Client: Environmental Planning Specialists, Inc.
Project Name: Transco
Workorder: 1901I45

ANALYTICAL QC SUMMARY REPORT

BatchID: 273370

Sample ID: **MB-273370** Client ID: Units: **ug/L** Prep Date: **01/23/2019** Run No: **389520**
SampleType: **MBLK** TestCode: **SIM Polynuclear Aromatic Hydrocarbons SW8270D** BatchID: **273370** Analysis Date: **01/23/2019** Seq No: **8712534**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1-Methylnaphthalene	BRL	0.50									
2-Methylnaphthalene	BRL	0.50									
Acenaphthene	BRL	0.50									
Acenaphthylene	BRL	1.0									
Anthracene	BRL	0.050									
Benz(a)anthracene	BRL	0.050									
Benzo(a)pyrene	BRL	0.050									
Benzo(b)fluoranthene	BRL	0.10									
Benzo(g,h,i)perylene	BRL	0.10									
Benzo(k)fluoranthene	BRL	0.050									
Chrysene	BRL	0.050									
Dibenz(a,h)anthracene	BRL	0.10									
Fluoranthene	BRL	0.10									
Fluorene	BRL	0.10									
Indeno(1,2,3-cd)pyrene	BRL	0.050									
Naphthalene	BRL	0.50									
Phenanthrene	BRL	0.050									
Pyrene	BRL	0.050									
Surr: 4-Terphenyl-d14	2.657	0	2.000		133	69.4	138				

Sample ID: **LCS-273370** Client ID: Units: **ug/L** Prep Date: **01/23/2019** Run No: **389520**
SampleType: **LCS** TestCode: **SIM Polynuclear Aromatic Hydrocarbons SW8270D** BatchID: **273370** Analysis Date: **01/23/2019** Seq No: **8712713**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1-Methylnaphthalene	1.845	0.50	2.000		92.3	66	125				
2-Methylnaphthalene	1.856	0.50	2.000		92.8	64.9	125				
Acenaphthene	1.895	0.50	2.000		94.7	70	120				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Environmental Planning Specialists, Inc.
Project Name: Transco
Workorder: 1901I45

ANALYTICAL QC SUMMARY REPORT

BatchID: 273370

Sample ID: **LCS-273370** Client ID: Units: **ug/L** Prep Date: **01/23/2019** Run No: **389520**
SampleType: **LCS** TestCode: **SIM Polynuclear Aromatic Hydrocarbons SW8270D** BatchID: **273370** Analysis Date: **01/23/2019** Seq No: **8712713**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Acenaphthylene	1.995	1.0	2.000		99.8	69.5	120				
Anthracene	2.111	0.050	2.000		106	70	126				
Benz(a)anthracene	2.251	0.050	2.000		113	70.9	147				
Benzo(a)pyrene	2.150	0.050	2.000		108	70	124				
Benzo(b)fluoranthene	2.671	0.10	2.000		134	65.6	134				
Benzo(g,h,i)perylene	2.105	0.10	2.000		105	66.2	128				
Benzo(k)fluoranthene	1.937	0.050	2.000		96.9	70.9	134				
Chrysene	2.107	0.050	2.000		105	70	133				
Dibenz(a,h)anthracene	2.196	0.10	2.000		110	56	128				
Fluoranthene	2.254	0.10	2.000		113	80.4	135				
Fluorene	2.051	0.10	2.000		103	70	122				
Indeno(1,2,3-cd)pyrene	2.243	0.050	2.000		112	63.6	131				
Naphthalene	1.734	0.50	2.000		86.7	68.8	120				
Phenanthrene	2.065	0.050	2.000		103	72.9	122				
Pyrene	2.061	0.050	2.000		103	70	130				
Surr: 4-Terphenyl-d14	2.088	0	2.000		104	69.4	138				

Sample ID: **1901I45-006AMS** Client ID: **19022-DUP** Units: **ug/L** Prep Date: **01/23/2019** Run No: **389520**
SampleType: **MS** TestCode: **SIM Polynuclear Aromatic Hydrocarbons SW8270D** BatchID: **273370** Analysis Date: **01/23/2019** Seq No: **8713193**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1-Methylnaphthalene	2.004	0.50	2.000		100	60.4	120				
2-Methylnaphthalene	2.016	0.50	2.000		101	56.1	122				
Acenaphthene	2.086	0.50	2.000		104	61.2	120				
Acenaphthylene	2.165	1.0	2.000		108	62.1	120				
Anthracene	2.245	0.050	2.000		112	65.2	124				
Benz(a)anthracene	2.481	0.050	2.000		124	69.2	134				
Benzo(a)pyrene	2.358	0.050	2.000		118	58.1	120				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Environmental Planning Specialists, Inc.
Project Name: Transco
Workorder: 1901I45

ANALYTICAL QC SUMMARY REPORT

BatchID: 273370

Sample ID: **1901I45-006AMS** Client ID: **19022-DUP** Units: **ug/L** Prep Date: **01/23/2019** Run No: **389520**
SampleType: **MS** TestCode: **SIM Polynuclear Aromatic Hydrocarbons SW8270D** BatchID: **273370** Analysis Date: **01/23/2019** Seq No: **8713193**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Benzo(b)fluoranthene	2.920	0.10	2.000		146	51.9	120				S
Benzo(g,h,i)perylene	2.201	0.10	2.000		110	44	120				
Benzo(k)fluoranthene	2.160	0.050	2.000		108	53.5	120				
Chrysene	2.315	0.050	2.000		116	64.5	129				
Dibenz(a,h)anthracene	2.355	0.10	2.000		118	37.4	120				
Fluoranthene	2.465	0.10	2.000		123	70.1	126				
Fluorene	2.228	0.10	2.000		111	63.1	120				
Indeno(1,2,3-cd)pyrene	2.217	0.050	2.000		111	46.4	120				
Naphthalene	1.917	0.50	2.000		95.9	56.7	120				
Phenanthrene	2.248	0.050	2.000		112	64.5	120				
Pyrene	2.328	0.050	2.000		116	61.5	136				
Surr: 4-Terphenyl-d14	2.380	0	2.000		119	69.4	138				

Sample ID: **1901I45-006AMSD** Client ID: **19022-DUP** Units: **ug/L** Prep Date: **01/23/2019** Run No: **389520**
SampleType: **MSD** TestCode: **SIM Polynuclear Aromatic Hydrocarbons SW8270D** BatchID: **273370** Analysis Date: **01/23/2019** Seq No: **8713195**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1-Methylnaphthalene	2.049	0.50	2.000		102	60.4	120	2.004	2.19	28.5	
2-Methylnaphthalene	2.064	0.50	2.000		103	56.1	122	2.016	2.36	26.6	
Acenaphthene	2.133	0.50	2.000		107	61.2	120	2.086	2.23	20.2	
Acenaphthylene	2.220	1.0	2.000		111	62.1	120	2.165	2.52	22	
Anthracene	2.291	0.050	2.000		115	65.2	124	2.245	2.02	20	
Benz(a)anthracene	2.547	0.050	2.000		127	69.2	134	2.481	2.61	23.7	
Benzo(a)pyrene	2.377	0.050	2.000		119	58.1	120	2.358	0.828	26.1	
Benzo(b)fluoranthene	2.976	0.10	2.000		149	51.9	120	2.920	1.91	25.4	S
Benzo(g,h,i)perylene	2.153	0.10	2.000		108	44	120	2.201	2.20	23.1	
Benzo(k)fluoranthene	2.271	0.050	2.000		114	53.5	120	2.160	4.98	22.7	
Chrysene	2.350	0.050	2.000		118	64.5	129	2.315	1.52	22.4	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Environmental Planning Specialists, Inc.
Project Name: Transco
Workorder: 1901I45

ANALYTICAL QC SUMMARY REPORT

BatchID: 273370

Sample ID: **1901I45-006AMSD** Client ID: **19022-DUP** Units: **ug/L** Prep Date: **01/23/2019** Run No: **389520**
SampleType: **MSD** TestCode: **SIM Polynuclear Aromatic Hydrocarbons SW8270D** BatchID: **273370** Analysis Date: **01/23/2019** Seq No: **8713195**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Dibenz(a,h)anthracene	2.306	0.10	2.000		115	37.4	120	2.355	2.13	31	
Fluoranthene	2.484	0.10	2.000		124	70.1	126	2.465	0.775	19.1	
Fluorene	2.286	0.10	2.000		114	63.1	120	2.228	2.56	22.2	
Indeno(1,2,3-cd)pyrene	2.309	0.050	2.000		115	46.4	120	2.217	4.11	26.1	
Naphthalene	1.941	0.50	2.000		97.0	56.7	120	1.917	1.23	19.7	
Phenanthrene	2.335	0.050	2.000		117	64.5	120	2.248	3.77	20.5	
Pyrene	3.105	0.050	2.000		155	61.5	136	2.328	28.6	19.4	SR
Surr: 4-Terphenyl-d14	2.627	0	2.000		131	69.4	138	2.380	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

November 20, 2018

Aaron Williams
EPS
400 Northridge Road
Suite 400
Sandy Springs, GA 30350

RE: TRANSCO

Pace Analytical received 7 samples on November 12, 2018 for analysis labeled 18312-RW-24, 18312-EW-13, 18311-TW-19, 18312-EW-10, 18310-TW-12, 18311-TW-18, and 18310-TW-20. Per client request, the following analyses were performed:

1. (C8-C40) Semi-Quantitative Molecular Characterization by GC/MS - full scan mode
2. Viscosity – Subcontracted to Clark Testing

The sample analyses were performed under laboratory number **28678**.

Please call the lab at 412-826-5245, or you may email any questions or concerns to ruth.welsh@pacelabs.com regarding any analytical data reports.

Respectfully submitted,

Ruth Welsh

Ruth Welsh
Customer Service

(C8-C40) Semi-Quantitative Molecular Characterization
by GC/MS - full scan mode
TIC, n-Alkanes, Iso-Alkanes, Isoprenoids, Alkylcyclohexanes,
C4-monoaromatics, Bicyclanes, Terpanes, Steranes

C8-C40 - Semi Quantitative Hydrocarbons Characterization
by GC/MS - full scan mode

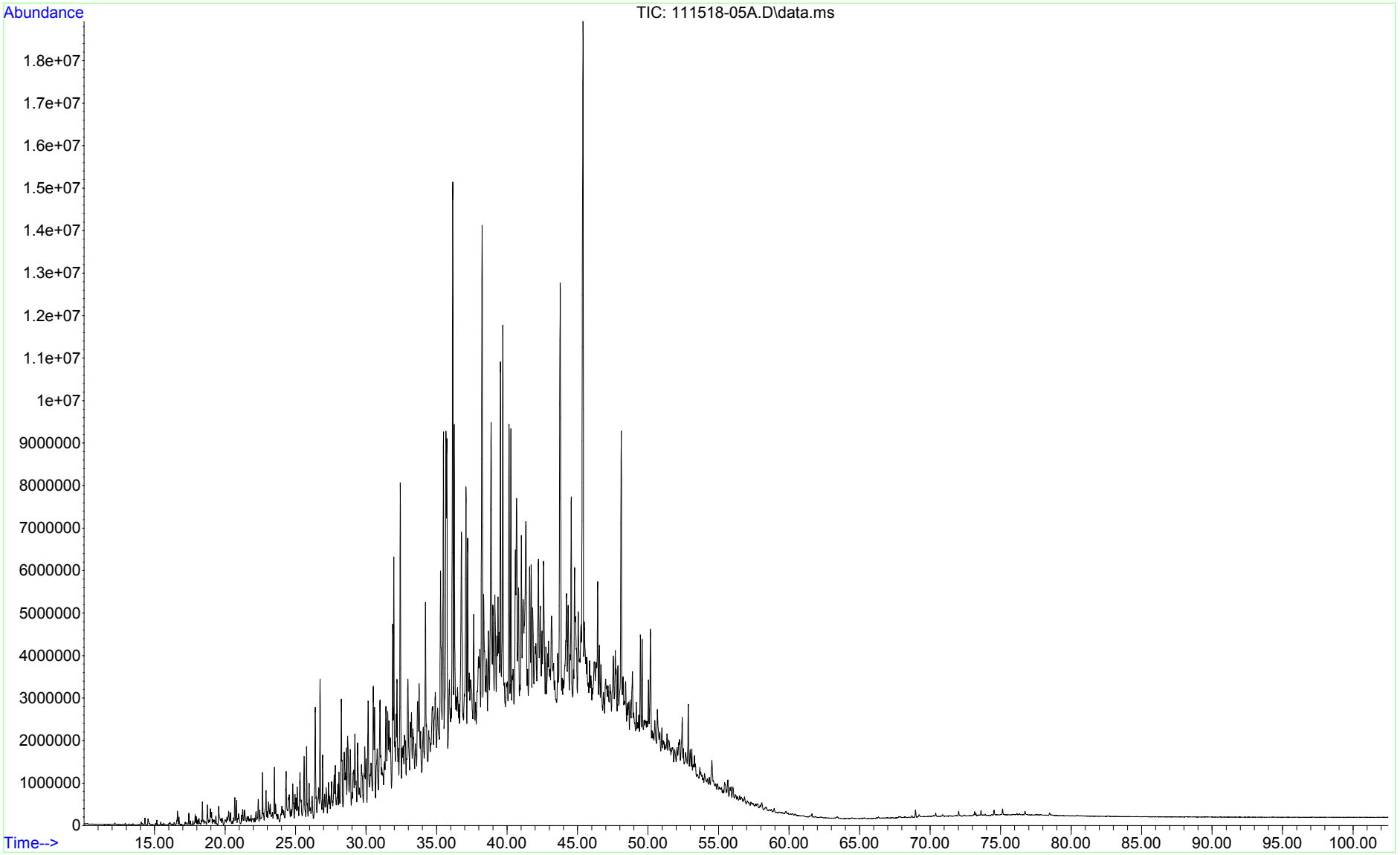
Mass Chromatograms

ION (m/z)	COMPOUND CLASS
TIC	All Compounds
85	n-Paraffins
113	Isoparaffins
83	Alkylcyclohexanes
134	C3-C4 Monoaromatics
123	Bicyclanes
191	Terpanes
217	Steranes
253	Monoaromatice Steranes
231	Triaromatic Steranes
Bar Diagram	Monoaromatic and Polyaromatic Hydrocarbon Distribution

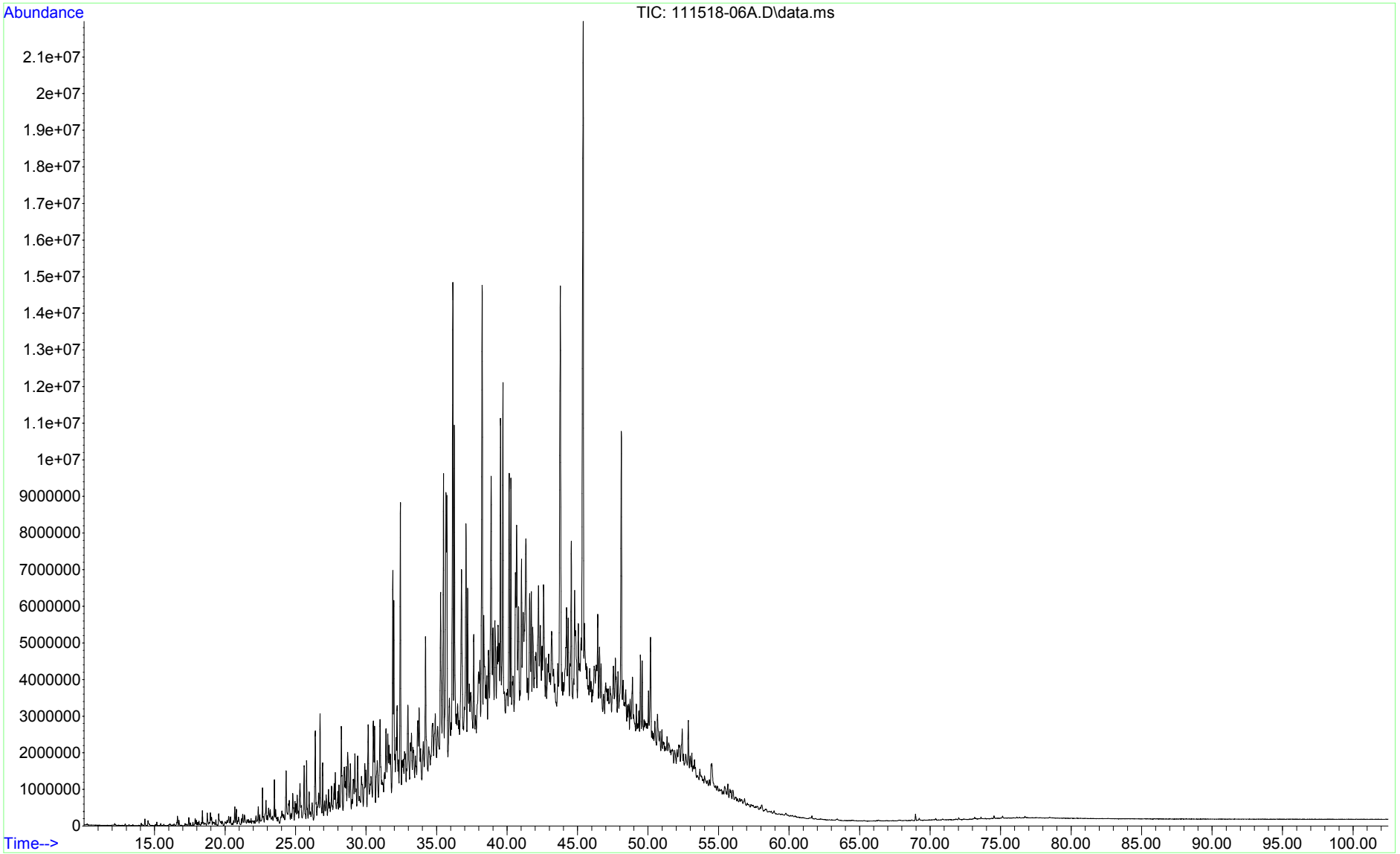
note: Chromatograms and data follow this cover page.

Submitted by,
Pace Analytical Energy Services

Sample Name: 28678-1 [18312-TW-24] 1/10
Misc Info : 0.4032g->10mL



Sample Name: 28678-6 [18311-TW-18] 1/10
Misc Info : 0.4458g->10mL



Chromatogram Key & Numerical Results: 85 m/z n-Paraffins

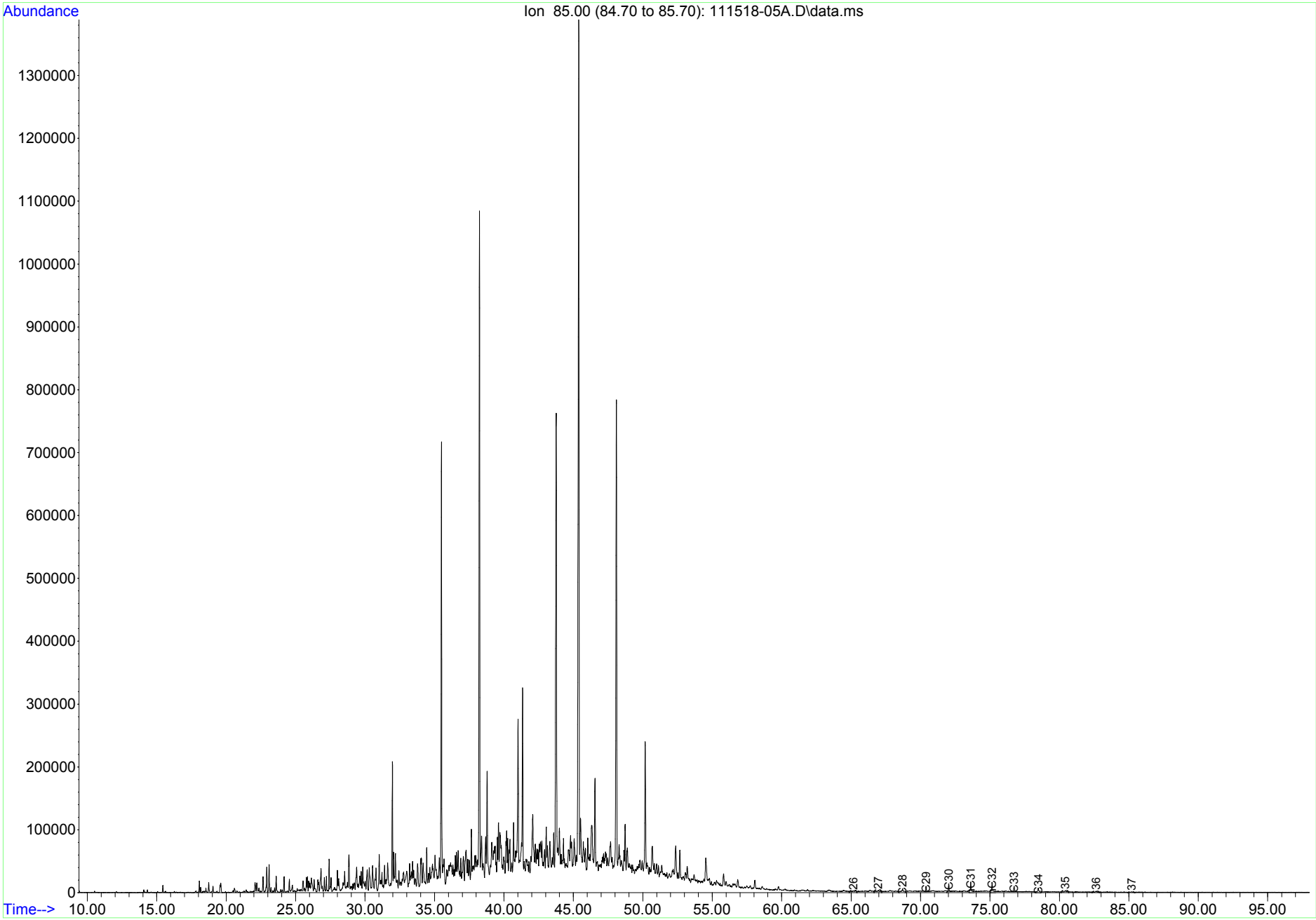
Project Manager:	A. Williams	Lab ID:	28678-1
Client:	EPS	Collected:	11/8/2018
Address:	400 Northridge Rd. Suite Sandy Springs, GA 30350	Received: Matrix:	11/12/2018 Product
Project:	TRANSCO	Client ID:	18312-TW-24 1/10
Project #:		Analyzed:	11/16/2018
Collected by:		Q Method:	FSRTL111618B.M

Identity	Symbol	Ion (m/z)	Retention Time	Peak Height	Rel. Height % (85 m/z)
n-Octane	nC8	85	ND	ND	ND
n-Nonane	nC9	85	ND	ND	ND
n-Decane	nC10	85	ND	ND	ND
n-Undecane	nC11	85	ND	ND	ND
n-Dodecane	nC12	85	ND	ND	ND
n-Tridecane	nC13	85	ND	ND	ND
n-Tetradecane	nC14	85	ND	ND	ND
n-Pentadecane	nC15	85	ND	ND	ND
n-Hexadecane	nC16	85	ND	ND	ND
n-Heptadecane	nC17	85	ND	ND	ND
n-Octadecane	nC18	85	ND	ND	ND
n-Nonadecane	nC19	85	ND	ND	ND
n-icosane	nC20	85	ND	ND	ND
n-Henicosane	nC21	85	ND	ND	ND
n-Docosane	nC22	85	ND	ND	ND
n-Tricosane	nC23	85	ND	ND	ND
n-Tetracosane	nC24	85	ND	ND	ND
n-Pentacosane	nC25	85	ND	ND	ND
n-Hexacosane	nC26	85	65.2	1252.0	1.6%
n-Heptacosane	nC27	85	67.0	1992.0	2.6%
n-Octacosane	nC28	85	68.7	4266.0	5.5%
n-Nonacosane	nC29	85	70.4	8489.0	11.0%
n-Triacontane	nC30	85	72.0	11990.0	15.6%
n-Hentriacontane	nC31	85	73.6	14769.0	19.2%
n-Dotriacontane	nC32	85	75.1	14379.0	18.7%
n-Tritriacontane	nC33	85	76.7	8775.0	11.4%
n-Tetratriacontane	nC34	85	78.5	6391.0	8.3%
n-Pentatriacontane	nC35	85	80.4	2258.0	2.9%
n-Hexatriacontane	nC36	85	82.6	1652.0	2.1%
n -Heptatriacontane	nC37	85	85.2	736.0	1.0%
n -Octatriacontane	nC38	85	ND	ND	ND
n -Nonatriacontane	nC39	85	ND	ND	ND
n-Tetracontane	nC40	85	ND	ND	ND

0.4032g->10mL
FOREN4LA_RTL.M

Submitted by,
Pace Energy Services, LLC

28678-1 [18312-TW-24] 1/10
0.4032g->10mL



Chromatogram Key & Numerical Results: 85 m/z n-Paraffins

Project Manager: A. Williams
Client: EPS

Address: 400 Northridge Rd. Suite
Sandy Springs, GA 30350

Project: TRANSCO
Project #:
Collected by:

Lab ID: 28678-6
Collected: 11/7/2018

Received: 11/12/2018
Matrix: Product

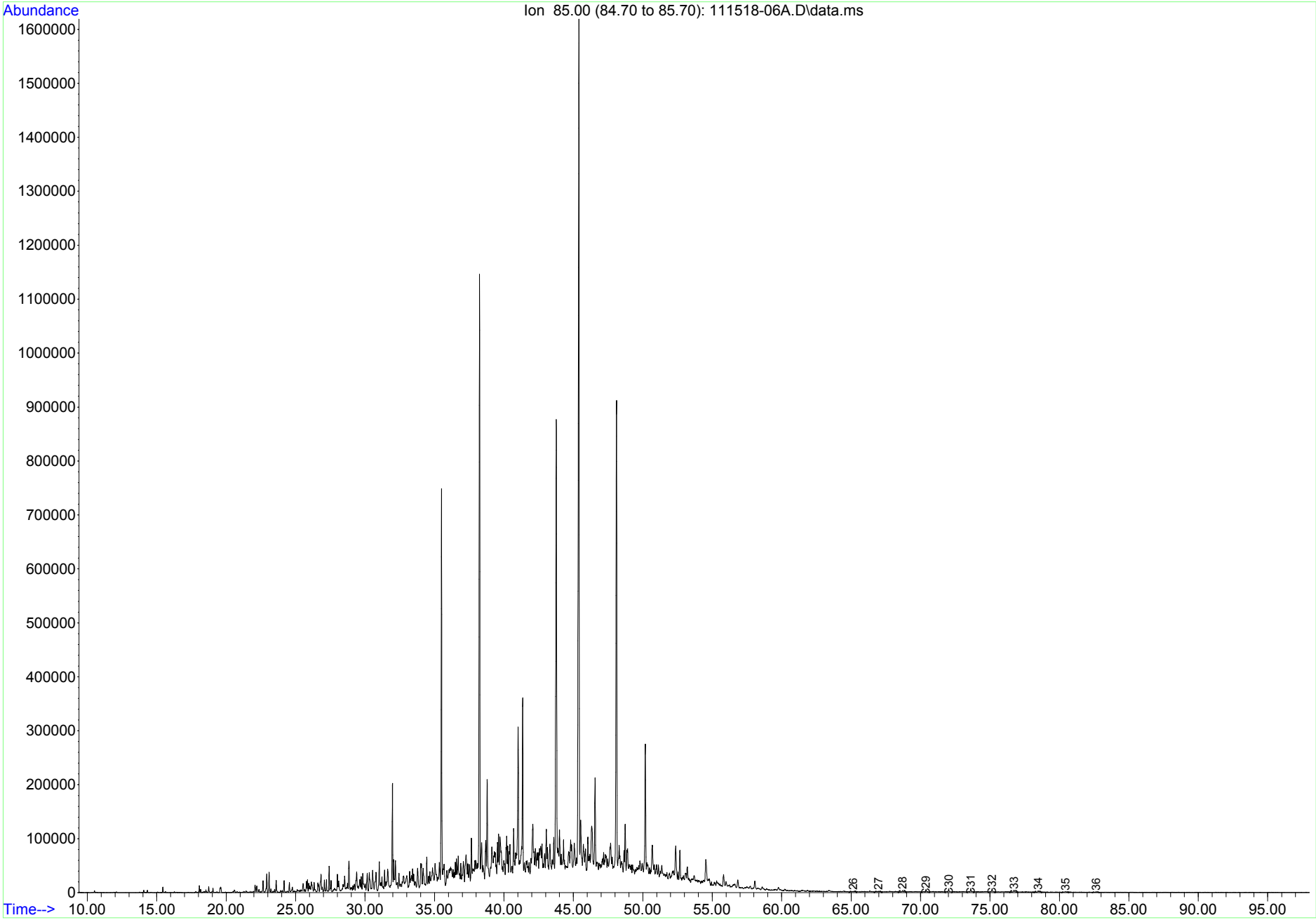
Client ID: 18311-TW-18 1/10
Analyzed: 11/17/2018
Q Method: FSRTL111618B.M

Identity	Symbol	Ion (m/z)	Retention Time	Peak Height	Rel. Height % (85 m/z)
n-Octane	nC8	85	ND	ND	ND
n-Nonane	nC9	85	ND	ND	ND
n-Decane	nC10	85	ND	ND	ND
n-Undecane	nC11	85	ND	ND	ND
n-Dodecane	nC12	85	ND	ND	ND
n-Tridecane	nC13	85	ND	ND	ND
n-Tetradecane	nC14	85	ND	ND	ND
n-Pentadecane	nC15	85	ND	ND	ND
n-Hexadecane	nC16	85	ND	ND	ND
n-Heptadecane	nC17	85	ND	ND	ND
n-Octadecane	nC18	85	ND	ND	ND
n-Nonadecane	nC19	85	ND	ND	ND
n-icosane	nC20	85	ND	ND	ND
n-Henicosane	nC21	85	ND	ND	ND
n-Docosane	nC22	85	ND	ND	ND
n-Tricosane	nC23	85	ND	ND	ND
n-Tetracosane	nC24	85	ND	ND	ND
n-Pentacosane	nC25	85	ND	ND	ND
n-Hexacosane	nC26	85	65.2	857.0	2.4%
n-Heptacosane	nC27	85	67.0	1484.0	4.2%
n-Octacosane	nC28	85	68.7	2616.0	7.4%
n-Nonacosane	nC29	85	70.4	4584.0	13.0%
n-Triacontane	nC30	85	72.0	5952.0	16.9%
n-Hentriacontane	nC31	85	73.6	6161.0	17.4%
n-Dotriacontane	nC32	85	75.2	5992.0	17.0%
n-Tritriacontane	nC33	85	76.7	3433.0	9.7%
n-Tetratriacontane	nC34	85	78.5	2436.0	6.9%
n-Pentatriacontane	nC35	85	80.4	1290.0	3.7%
n-Hexatriacontane	nC36	85	82.6	504.0	1.4%
n -Heptatriacontane	nC37	85	ND	ND	ND
n -Octatriacontane	nC38	85	ND	ND	ND
n -Nonatriacontane	nC39	85	ND	ND	ND
n-Tetracontane	nC40	85	ND	ND	ND

0.4458g->10mL
FOREN4LA_RTL.M

Submitted by,
Pace Energy Services, LLC

28678-6 [18311-TW-18] 1/10
0.4458g->10mL



Chromatogram Key & Numerical Results: 113 m/z Isoparaffins

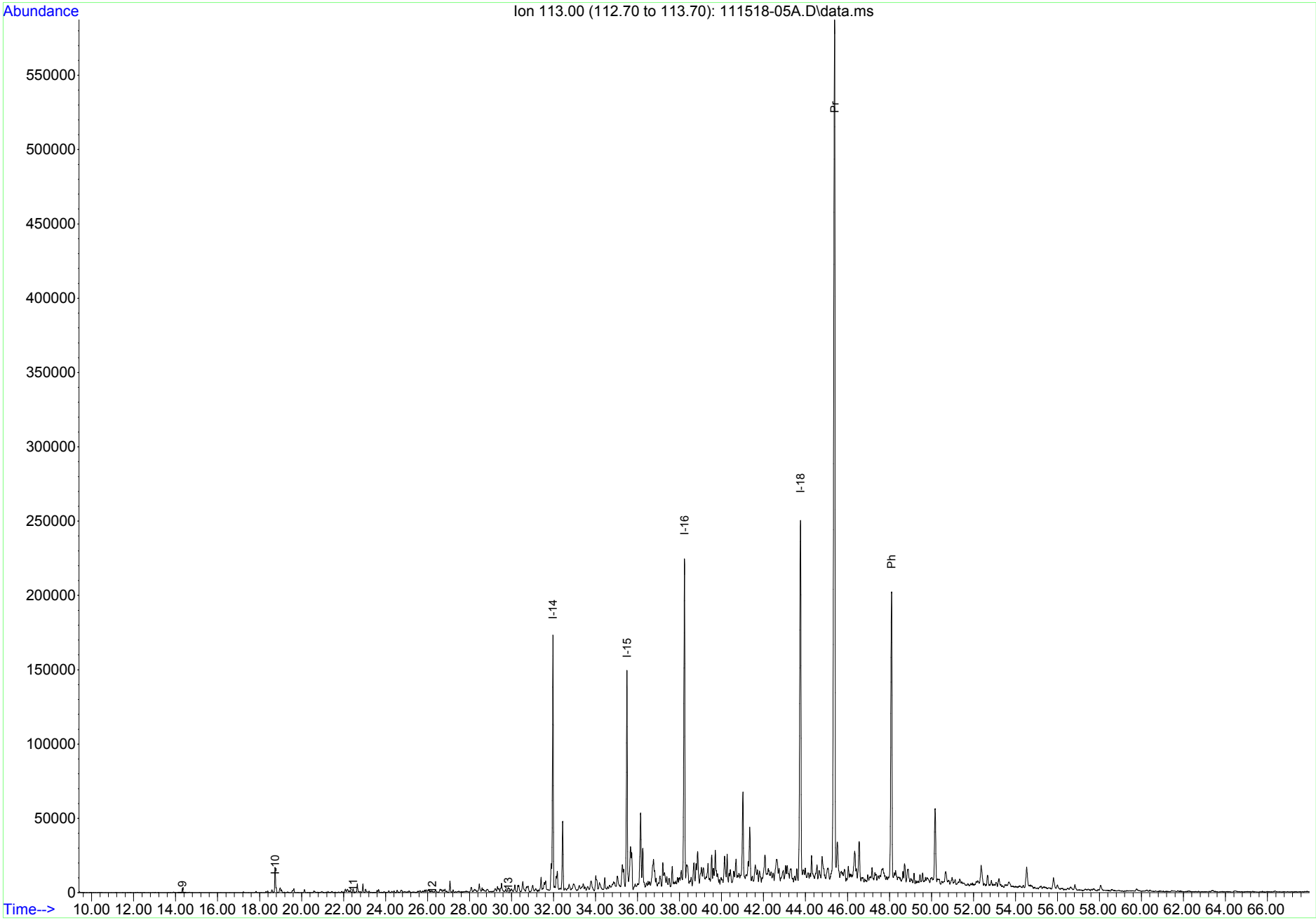
Project Manager:	A. Williams	Lab ID:	28678-1
Client:	EPS	Collected:	11/8/2018
Address:	400 Northridge Rd. Suite Sandy Springs, GA 30350	Received: Matrix:	11/12/2018 Product
Project:	TRANSCO	Client ID:	18312-TW-24 1/10
Project #:		Analyzed:	11/16/2018
Collected by:		Q Method:	FSRTL111618B.M

Identity	Symbol	Ion (m/z)	Retention Time	Peak Height	Rel. Height % (113 m/z)
Iso-alkane w/ 9 Carbon Atoms	I-9	113	14.3	3250.0	0.2%
Iso-alkane w/ 10 Carbon Atoms	I-10	113	18.7	17128.0	1.1%
Iso-alkane w/ 11 Carbon Atoms	I-11	113	22.5	2654.0	0.2%
Iso-alkane w/ 12 Carbon Atoms	I-12	113	26.2	881.0	0.1%
Iso-alkane w/ 13 Carbon Atoms	I-13	113	29.9	2842.0	0.2%
Iso-alkane w/ 14 Carbon Atoms	I-14	113	32.0	169759.0	10.8%
Farnesane (Isoprenoid - C15)	I-15	113	35.5	145585.0	9.3%
Iso-alkane w/ 16 Carbon Atoms	I-16	113	38.2	216047.0	13.8%
Iso-alkane w/ 18 Carbon Atoms	I-18	113	43.8	242399.0	15.5%
Pristane (Isoprenoid - C19)	Pr	113	45.4	575109.0	36.7%
Phytane (Isoprenoid - C20)	Ph	113	48.1	192772.0	12.3%

0.4032g->10mL
FOREN4LA_RTL.M

Submitted by,
Pace Energy Services, LLC

28678-1 [18312-TW-24] 1/10
0.4032g->10mL



Chromatogram Key & Numerical Results: 113 m/z Isoparaffins

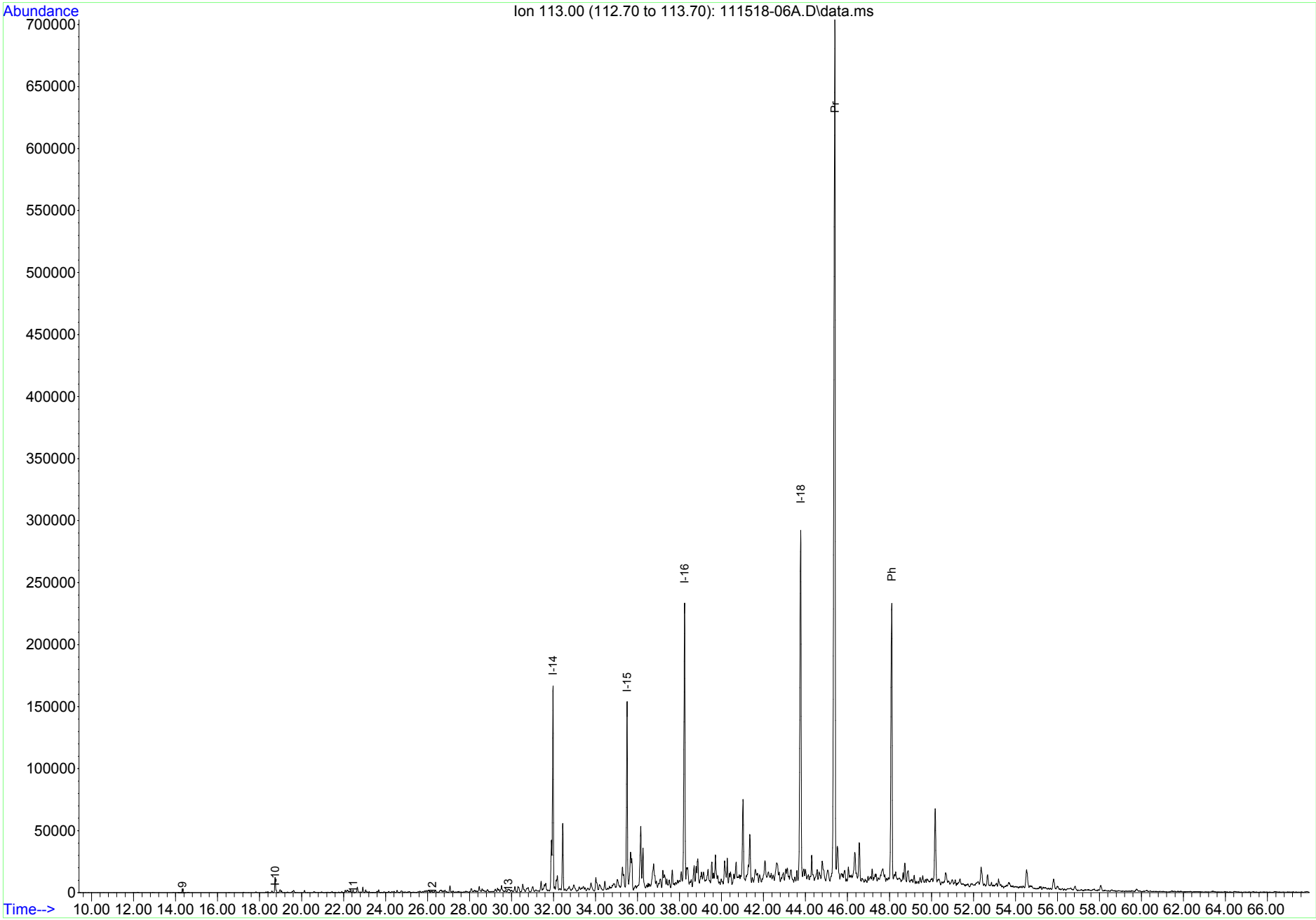
Project Manager:	A. Williams	Lab ID:	28678-6
Client:	EPS	Collected:	11/7/2018
Address:	400 Northridge Rd. Suite Sandy Springs, GA 30350	Received: Matrix:	11/12/2018 Product
Project:	TRANSCO	Client ID:	18311-TW-18 1/10
Project #:		Analyzed:	11/17/2018
Collected by:		Q Method:	FSRTL111618B.M

Identity	Symbol	Ion (m/z)	Retention Time	Peak Height	Rel. Height % (113 m/z)
Iso-alkane w/ 9 Carbon Atoms	I-9	113	14.3	3225.0	0.2%
Iso-alkane w/ 10 Carbon Atoms	I-10	113	18.7	12413.0	0.7%
Iso-alkane w/ 11 Carbon Atoms	I-11	113	22.5	2178.0	0.1%
Iso-alkane w/ 12 Carbon Atoms	I-12	113	26.2	1085.0	0.1%
Iso-alkane w/ 13 Carbon Atoms	I-13	113	29.8	2211.0	0.1%
Iso-alkane w/ 14 Carbon Atoms	I-14	113	32.0	163317.0	9.3%
Farnesane (Isoprenoid - C15)	I-15	113	35.5	149727.0	8.5%
Iso-alkane w/ 16 Carbon Atoms	I-16	113	38.2	224483.0	12.8%
Iso-alkane w/ 18 Carbon Atoms	I-18	113	43.8	282721.0	16.1%
Pristane (Isoprenoid - C19)	Pr	113	45.4	694639.0	39.5%
Phytane (Isoprenoid - C20)	Ph	113	48.1	222533.0	12.7%

0.4458g->10mL
FOREN4LA_RTL.M

Submitted by,
Pace Energy Services, LLC

28678-6 [18311-TW-18] 1/10
0.4458g->10mL



Chromatogram Key & Numerical Results: 83 m/z Alkylcyclohexanes

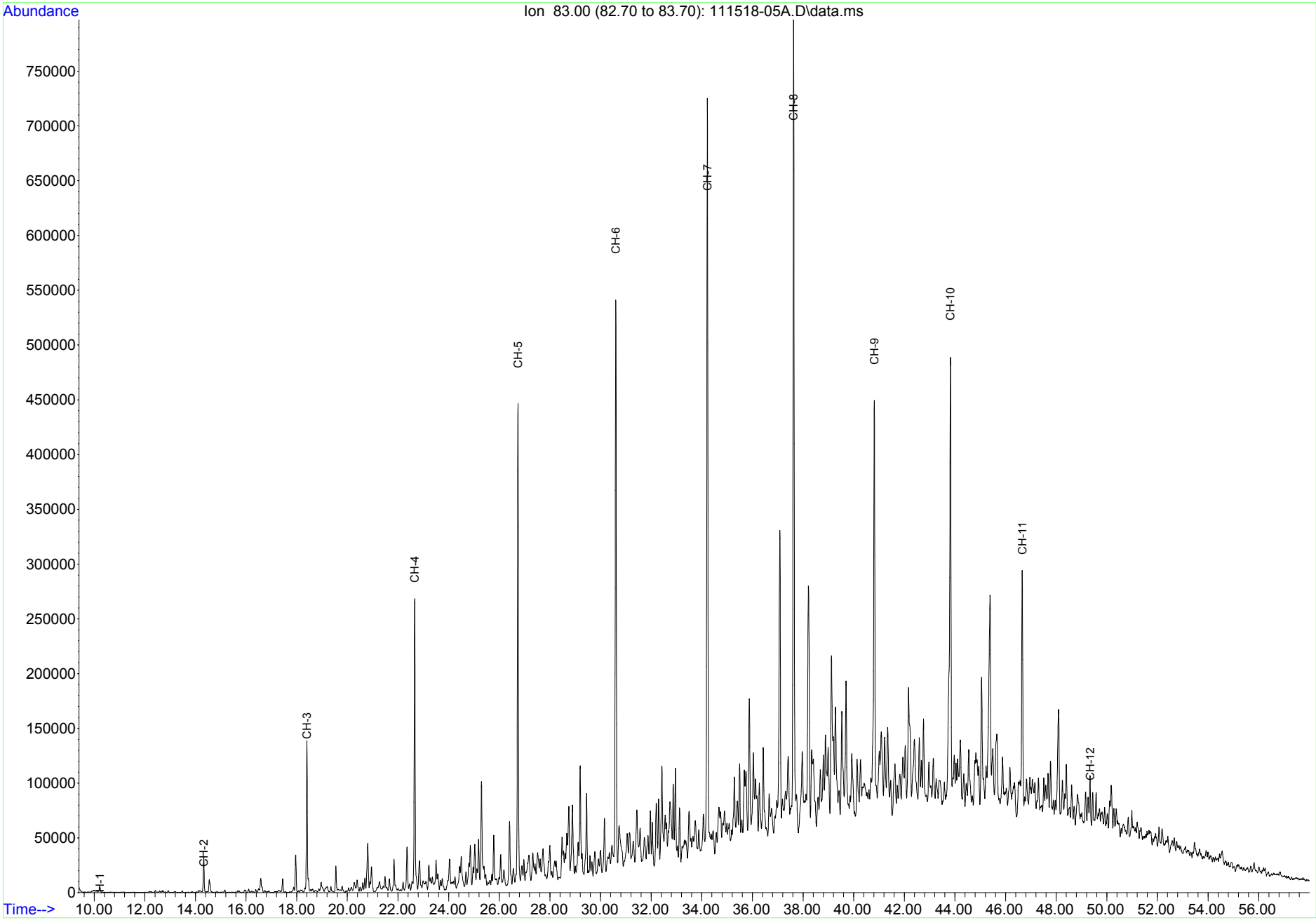
Project Manager:	A. Williams	Lab ID:	28678-1
Client:	EPS	Collected:	11/8/2018
Address:	400 Northridge Rd. Suite Sandy Springs, GA 30350	Received: Matrix:	11/12/2018 Product
Project:	TRANSCO	Client ID:	18312-TW-24 1/10
Project #:		Analyzed:	11/16/2018
Collected by:		Q Method:	FSRTL111618B.M

Identity	Symbol	Ion (m/z)	Retention Time	Peak Height	Rel. Height % (83 m/z)
Methylcyclohexane	CH-1	83	10.2	4481.0	0.1%
Ethylcyclohexane	CH-2	83	14.3	32245.0	0.8%
Propylcyclohexane	CH-3	83	18.4	135363.0	3.6%
Butylcyclohexane	CH-4	83	22.7	265339.0	7.0%
Pentylcyclohexane	CH-5	83	26.7	435418.0	11.5%
Hexylcyclohexane	CH-6	83	30.6	518788.0	13.6%
Heptylcyclohexane	CH-7	83	34.2	677368.0	17.8%
Octylcyclohexane	CH-8	83	37.6	718392.0	18.9%
Nonylcyclohexane	CH-9	83	40.8	352630.0	9.3%
Decylcyclohexane	CH-10	83	43.8	401289.0	10.6%
Undecylcyclohexane	CH-11	83	46.7	215024.0	5.7%
Dodecylcyclohexane	CH-12	83	49.3	45712.0	1.2%
Tridecylcyclohexane	CH-13	83	ND	ND	ND
Tetradecylcyclohexane	CH-14	83	ND	ND	ND

0.4032g->10mL
FOREN4LA_RTL.M

Submitted by,
Pace Energy Services, LLC

28678-1 [18312-TW-24] 1/10
0.4032g->10mL



Chromatogram Key & Numerical Results: 83 m/z Alkylcyclohexanes

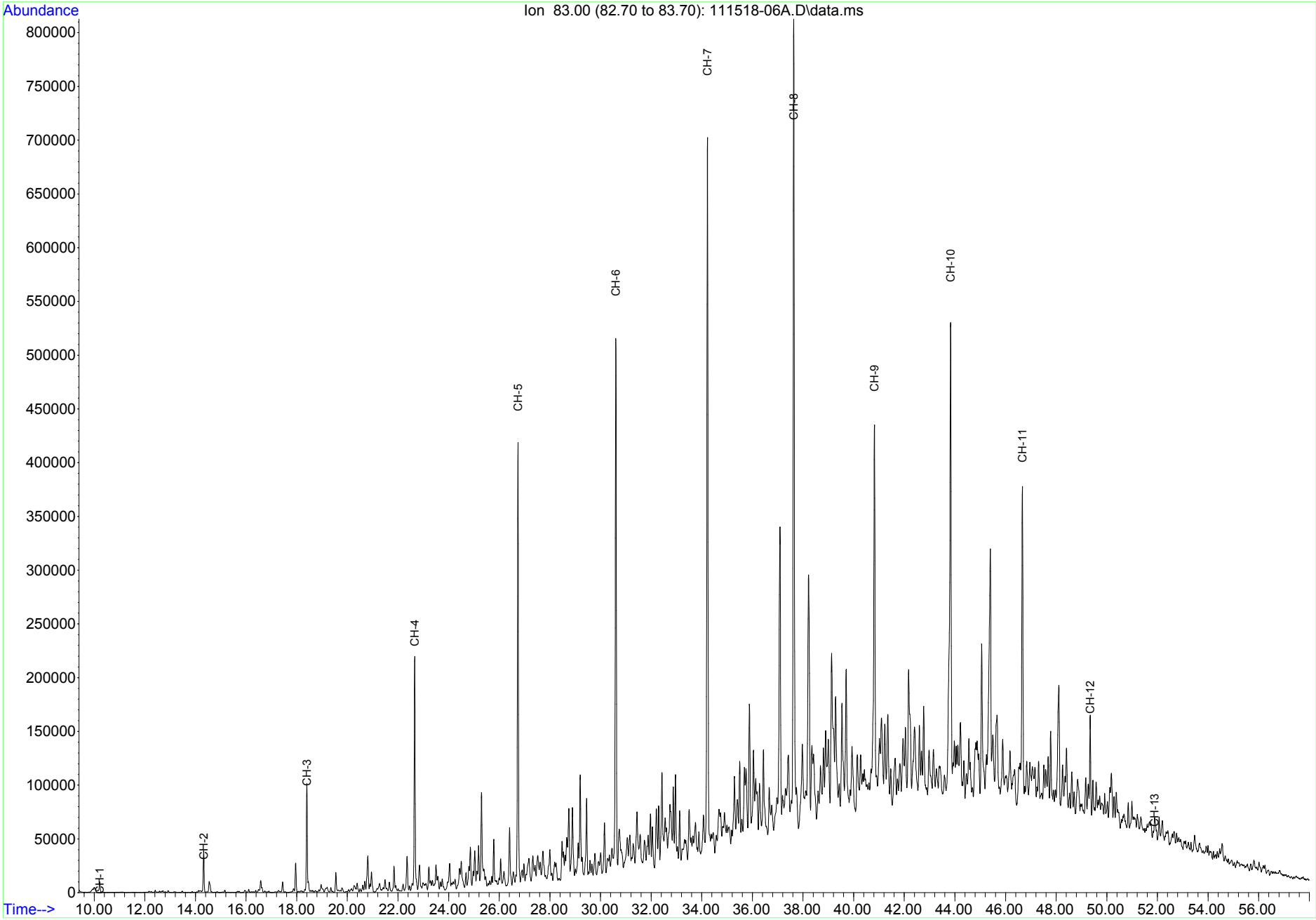
Project Manager:	A. Williams	Lab ID:	28678-6
Client:	EPS	Collected:	11/7/2018
Address:	400 Northridge Rd. Suite Sandy Springs, GA 30350	Received: Matrix:	11/12/2018 Product
Project:	TRANSCO	Client ID:	18311-TW-18 1/10
Project #:		Analyzed:	11/17/2018
Collected by:		Q Method:	FSRTL111618B.M

Identity	Symbol	Ion (m/z)	Retention Time	Peak Height	Rel. Height % (83 m/z)
Methylcyclohexane	CH-1	83	10.2	9692.0	0.3%
Ethylcyclohexane	CH-2	83	14.3	38659.0	1.0%
Propylcyclohexane	CH-3	83	18.4	99110.0	2.6%
Butylcyclohexane	CH-4	83	22.7	216914.0	5.7%
Pentylcyclohexane	CH-5	83	26.7	408990.0	10.7%
Hexylcyclohexane	CH-6	83	30.6	489800.0	12.9%
Heptylcyclohexane	CH-7	83	34.2	656736.0	17.2%
Octylcyclohexane	CH-8	83	37.6	729360.0	19.2%
Nonylcyclohexane	CH-9	83	40.8	328587.0	8.6%
Decylcyclohexane	CH-10	83	43.8	436017.0	11.4%
Undecylcyclohexane	CH-11	83	46.7	286008.0	7.5%
Dodecylcyclohexane	CH-12	83	49.3	93120.0	2.4%
Tridecylcyclohexane	CH-13	83	51.9	15027.0	0.4%
Tetradecylcyclohexane	CH-14	83	ND	ND	ND

0.4458g->10mL
FOREN4LA_RTL.M

Submitted by,
Pace Energy Services, LLC

28678-6 [18311-TW-18] 1/10
0.4458g->10mL



Chromatogram Key & Numerical Results: 134 m/z C3-C4 Monoaromatics

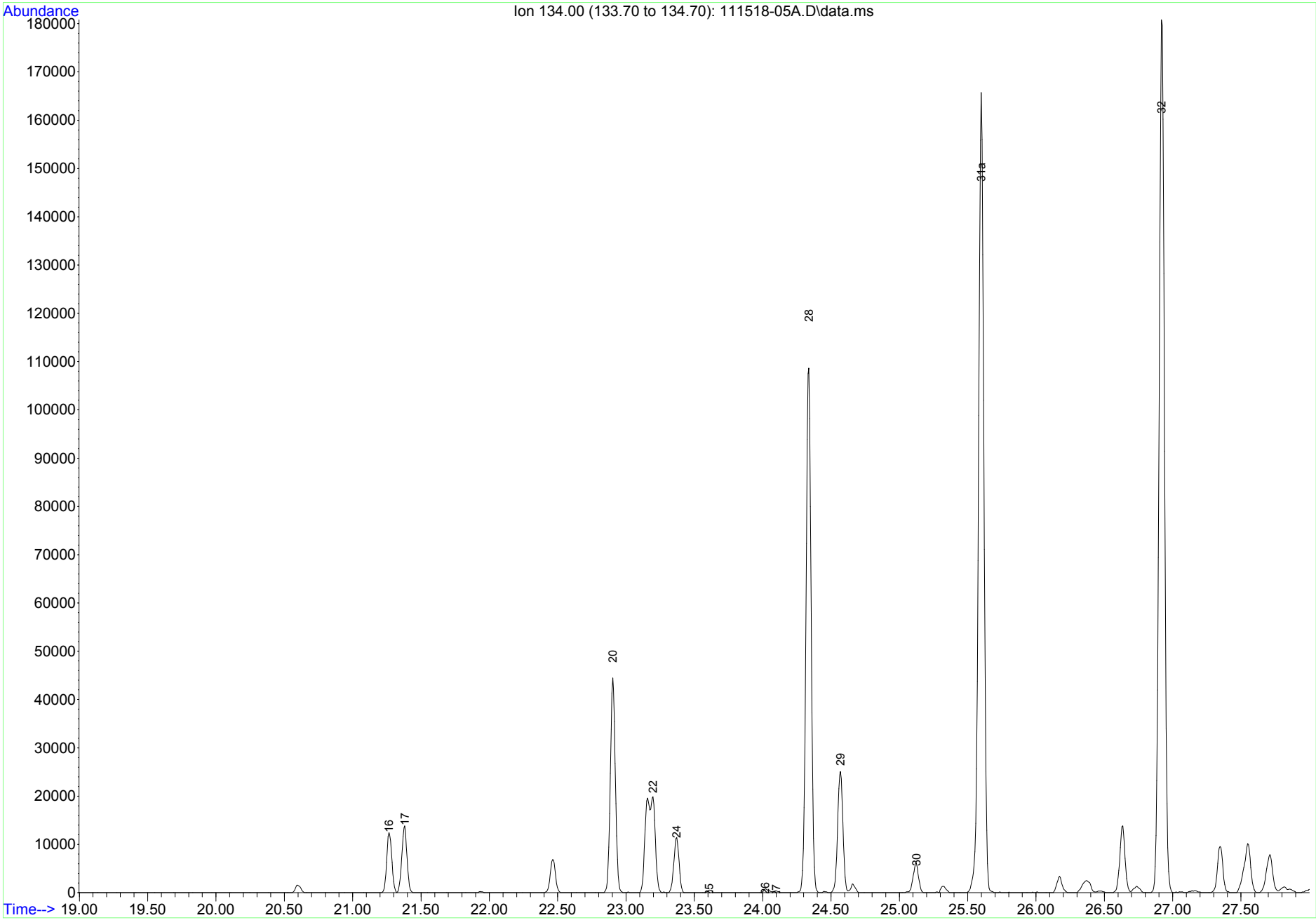
Project Manager:	A. Williams	Lab ID:	28678-1
Client:	EPS	Collected:	11/8/2018
Address:	400 Northridge Rd. Suite Sandy Springs, GA 30350	Received:	11/12/2018
		Matrix:	Product
Project:	TRANSCO	Client ID:	18312-TW-24 1/10
Project #:		Analyzed:	11/16/2018
Collected by:		Q Method:	FSRTL111618B.M

Identity	Symbol	Ion (m/z)	Retention Time	Peak Height	Rel. Height % (134 m/z)
Sec-Butylbenzene	16	134	21.3	12474.0	2.1%
1-Methyl-3-Isopropylbenzene	17	134	21.4	13860.0	2.3%
1-Methyl-4-Isopropylbenzene	18	134	ND	ND	ND
1-Methyl-2-Isopropylbenzene	19	134	ND	ND	ND
1,3-Diethylbenzene	20	134	22.9	44480.0	7.5%
1-Methyl-3-Propylbenzene	21	134	ND	ND	ND
Butylbenzene	22	134	23.2	19904.0	3.4%
1,3-Diethyl-5-Ethylbenzene	23	134	ND	ND	ND
1,2-Diethylbenzene	24	134	23.4	11456.0	1.9%
1-Methyl-2-Propylbenzene	25	134	23.6	547.0	0.1%
1,4-Dimethyl-2-Ethylbenzene	26	134	24.0	784.0	0.1%
1,3-Dimethyl-4-Ethylbenzene	27	134	24.1	370.0	0.1%
1,2-Dimethyl-4-Ethylbenzene	28	134	24.3	108664.0	18.4%
1,3-Dimethyl-2-Ethylbenzene	29	134	24.6	25112.0	4.3%
1,2-Dimethyl-3-Ethylbenzene	30	134	25.1	6179.0	1.0%
1,2,4,5-Tetramethylbenzene	31a	134	25.6	165760.0	28.1%
1,2,3,5-Tetramethylbenzene	31	134	ND	ND	ND
1,2,3,4-Tetramethylbenzene	32	134	26.9	180800.0	30.6%

0.4032g->10mL
FOREN4LA_RTL.M

Submitted by,
Pace Energy Services, LLC

28678-1 [18312-TW-24] 1/10
0.4032g->10mL



Chromatogram Key & Numerical Results: 134 m/z C3-C4 Monoaromatics

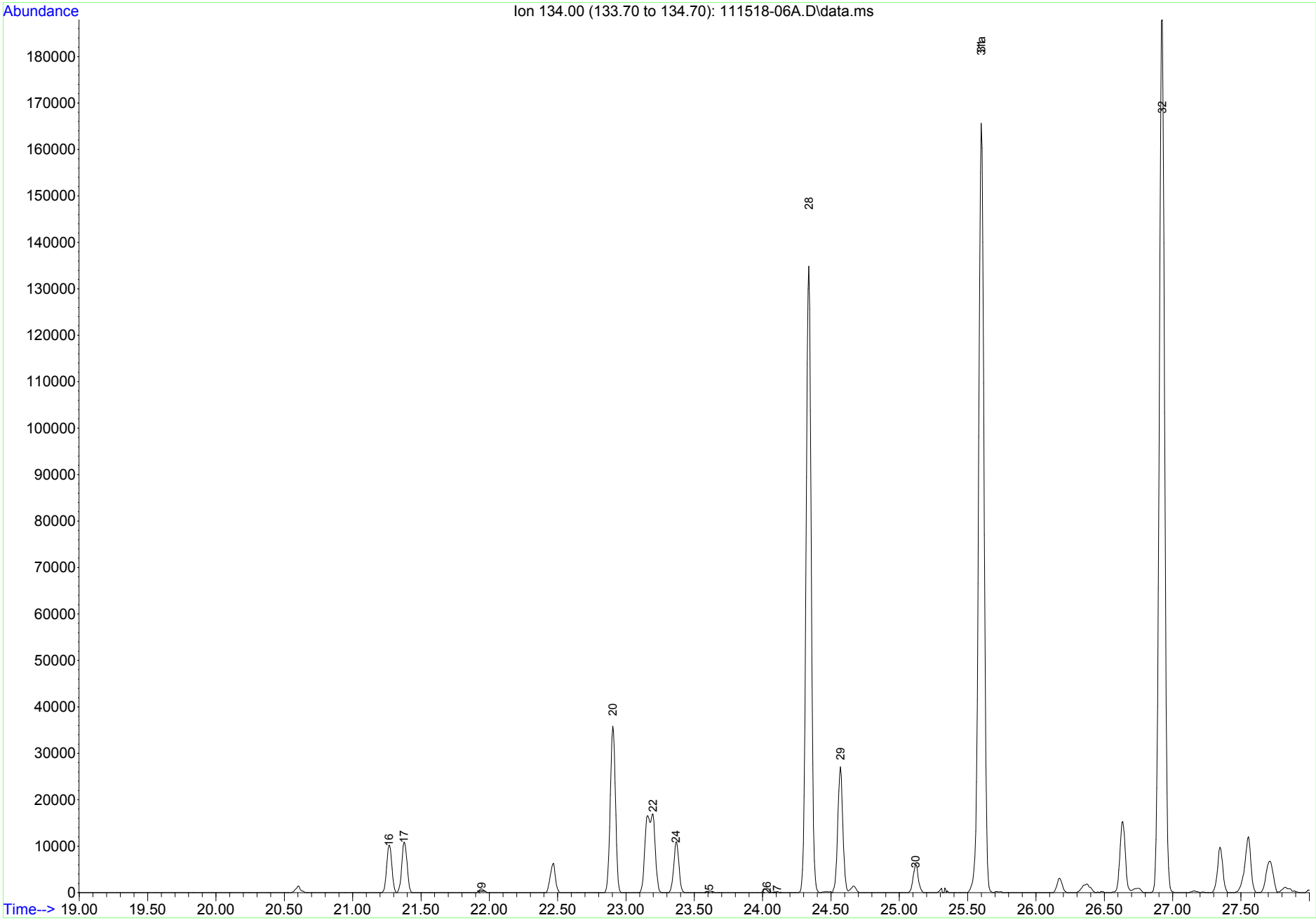
Project Manager:	A. Williams	Lab ID:	28678-6
Client:	EPS	Collected:	11/7/2018
Address:	400 Northridge Rd. Suite Sandy Springs, GA 30350	Received: Matrix:	11/12/2018 Product
Project:	TRANSCO	Client ID:	18311-TW-18 1/10
Project #:		Analyzed:	11/17/2018
Collected by:		Q Method:	FSRTL111618B.M

Identity	Symbol	Ion (m/z)	Retention Time	Peak Height	Rel. Height % (134 m/z)
Sec-Butylbenzene	16	134	21.3	10245.0	1.3%
1-Methyl-3-Isopropylbenzene	17	134	21.4	10905.0	1.4%
1-Methyl-4-Isopropylbenzene	18	134	ND	ND	ND
1-Methyl-2-Isopropylbenzene	19	134	21.9	812.0	0.1%
1,3-Diethylbenzene	20	134	22.9	35824.0	4.6%
1-Methyl-3-Propylbenzene	21	134	ND	ND	ND
Butylbenzene	22	134	23.2	16968.0	2.2%
1,3-Diethyl-5-Ethylbenzene	23	134	ND	ND	ND
1,2-Diethylbenzene	24	134	23.4	10896.0	1.4%
1-Methyl-2-Propylbenzene	25	134	23.6	391.0	0.1%
1,4-Dimethyl-2-Ethylbenzene	26	134	24.0	919.0	0.1%
1,3-Dimethyl-4-Ethylbenzene	27	134	24.1	253.0	0.0%
1,2-Dimethyl-4-Ethylbenzene	28	134	24.3	134848.0	17.4%
1,3-Dimethyl-2-Ethylbenzene	29	134	24.6	27104.0	3.5%
1,2-Dimethyl-3-Ethylbenzene	30	134	25.1	5981.0	0.8%
1,2,4,5-Tetramethylbenzene	31a	134	25.6	165632.0	21.4%
1,2,3,5-Tetramethylbenzene	31	134	25.6	165632.0	21.4%
1,2,3,4-Tetramethylbenzene	32	134	26.9	187904.0	24.3%

0.4458g->10mL
FOREN4LA_RTL.M

Submitted by,
Pace Energy Services, LLC

28678-6 [18311-TW-18] 1/10
0.4458g->10mL



Chromatogram Key & Numerical Results: 123 m/z Bicyclanes

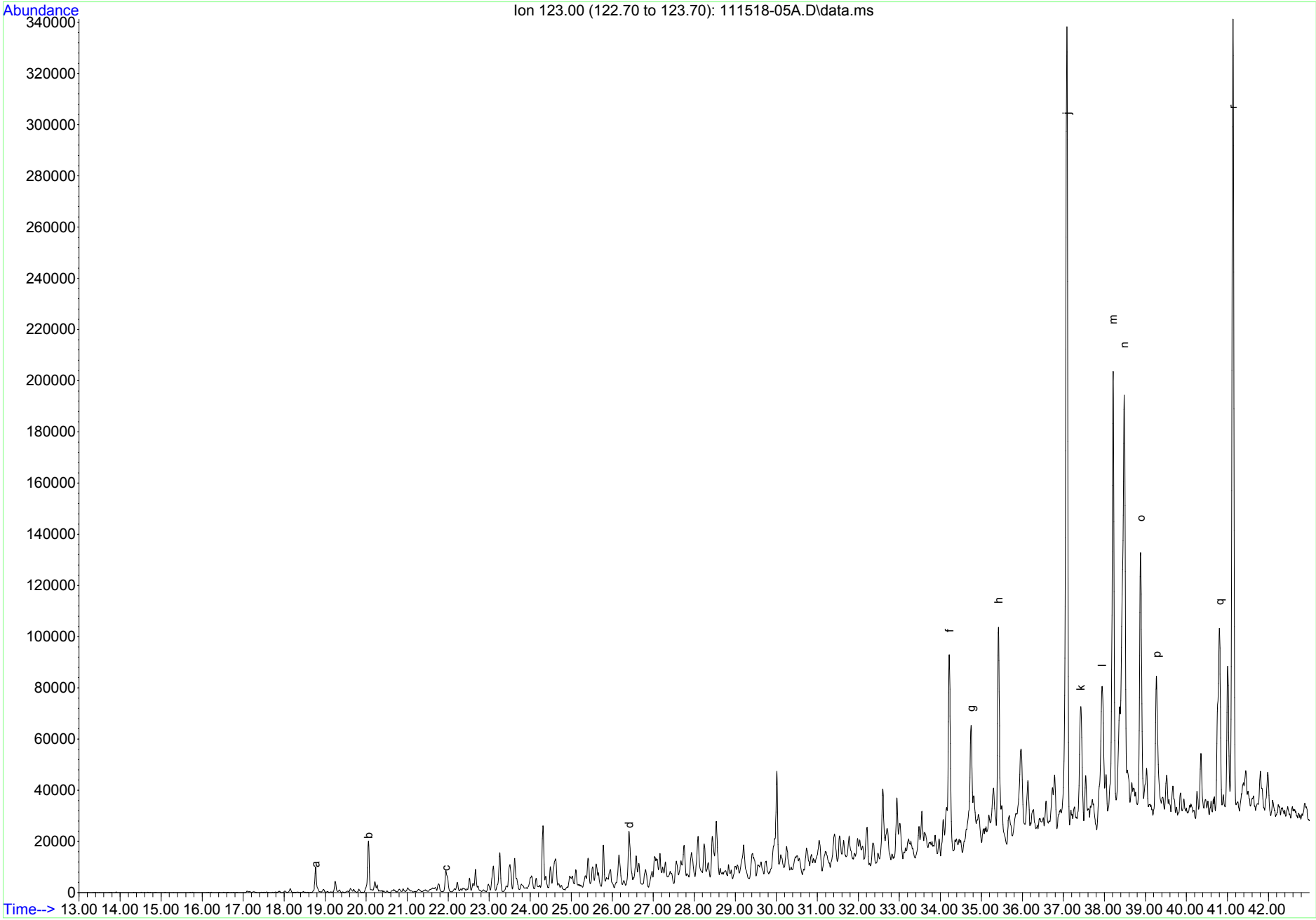
Project Manager:	A. Williams	Lab ID:	28678-1
Client:	EPS	Collected:	11/8/2018
Address:	400 Northridge Rd. Suite Sandy Springs, GA 30350	Received:	11/12/2018
		Matrix:	Product
Project:	TRANSCO	Client ID:	18312-TW-24 1/10
Project #:		Analyzed:	11/16/2018
Collected by:		Q Method:	FSRTL111618B.M

Identity	Symbol	Ion (m/z)	Retention Time	Peak Height	Rel. Height % (123 m/z)
2,2,3-Trimethylbicycloheptane	a	123	18.8	10142.0	0.7%
C_{10} bicycloalkane	b	123	20.1	20200.0	1.3%
3,3,7-Trimethylbicycloheptane	c	123	21.9	8466.0	0.6%
C_{11} Decalin	d	123	26.4	21067.0	1.4%
Nordrimane	f	123	34.2	76651.0	5.0%
Nordrimane	g	123	34.8	49646.0	3.3%
Rearranged drimane	h	123	35.4	77448.0	5.1%
Rearranged drimane	j	123	37.1	311856.0	20.4%
Isomer of Eudesmane	k	123	37.4	44640.0	2.9%
4β (H) Eudesmane	l	123	38.0	56128.0	3.7%
C_{15} Bicyclic Sesquiterpane	m	123	38.2	170400.0	11.2%
8β (H) Drimane	n	123	38.5	148315.0	9.7%
C_{15} Bicyclic Sesquiterpane	o	123	38.9	98572.0	6.5%
C_{16} Bicyclic Sesquiterpane	p	123	39.3	54360.0	3.6%
C_{16} Bicyclic Sesquiterpane	q	123	40.8	71336.0	4.7%
8β (H) Homodrimane	r	123	41.1	306960.0	20.1%

0.4032g->10mL
FOREN4LA_RTL.M

Submitted by,
Pace Energy Services, LLC

28678-1 [18312-TW-24] 1/10
0.4032g->10mL



Chromatogram Key & Numerical Results: 123 m/z Bicyclanes

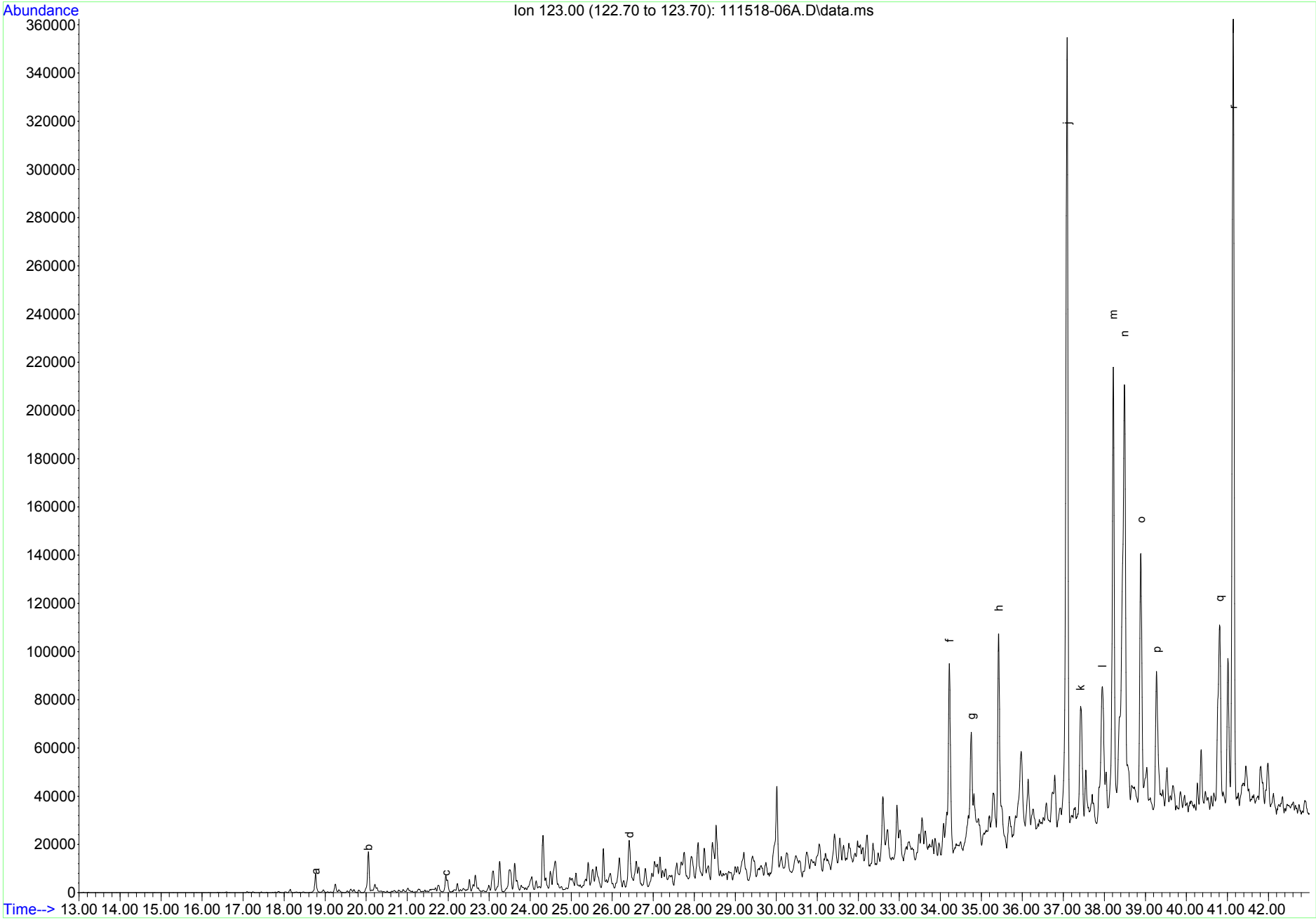
Project Manager:	A. Williams	Lab ID:	28678-6
Client:	EPS	Collected:	11/7/2018
Address:	400 Northridge Rd. Suite Sandy Springs, GA 30350	Received:	11/12/2018
		Matrix:	Product
Project:	TRANSCO	Client ID:	18311-TW-18 1/10
Project #:		Analyzed:	11/17/2018
Collected by:		Q Method:	FSRTL111618B.M

Identity	Symbol	Ion (m/z)	Retention Time	Peak Height	Rel. Height % (123 m/z)
2,2,3-Trimethylbicycloheptane	a	123	18.8	8089.0	0.5%
C_{10} bicycloalkane	b	123	20.1	16928.0	1.1%
3,3,7-Trimethylbicycloheptane	c	123	21.9	7172.0	0.5%
C_{11} Decalin	d	123	26.4	19407.0	1.2%
Nordrimane	f	123	34.2	78576.0	4.9%
Nordrimane	g	123	34.8	35218.0	2.2%
Rearranged drimane	h	123	35.4	88936.0	5.6%
Rearranged drimane	j	123	37.1	325704.0	20.4%
Isomer of Eudesmane	k	123	37.4	46614.0	2.9%
4β (H) Eudesmane	l	123	38.0	56848.0	3.6%
C_{15} Bicyclic Sesquiterpane	m	123	38.2	182616.0	11.5%
8β (H) Drimane	n	123	38.5	169192.0	10.6%
C_{15} Bicyclic Sesquiterpane	o	123	38.9	103200.0	6.5%
C_{16} Bicyclic Sesquiterpane	p	123	39.3	57456.0	3.6%
C_{16} Bicyclic Sesquiterpane	q	123	40.8	73056.0	4.6%
8β (H) Homodrimane	r	123	41.1	323703.0	20.3%

0.4458g->10mL
FOREN4LA_RTL.M

Submitted by,
Pace Energy Services, LLC

28678-6 [18311-TW-18] 1/10
0.4458g->10mL



Chromatogram Key & Numerical Results: 191 m/z Terpanes

Pace Analytical® Energy Services™

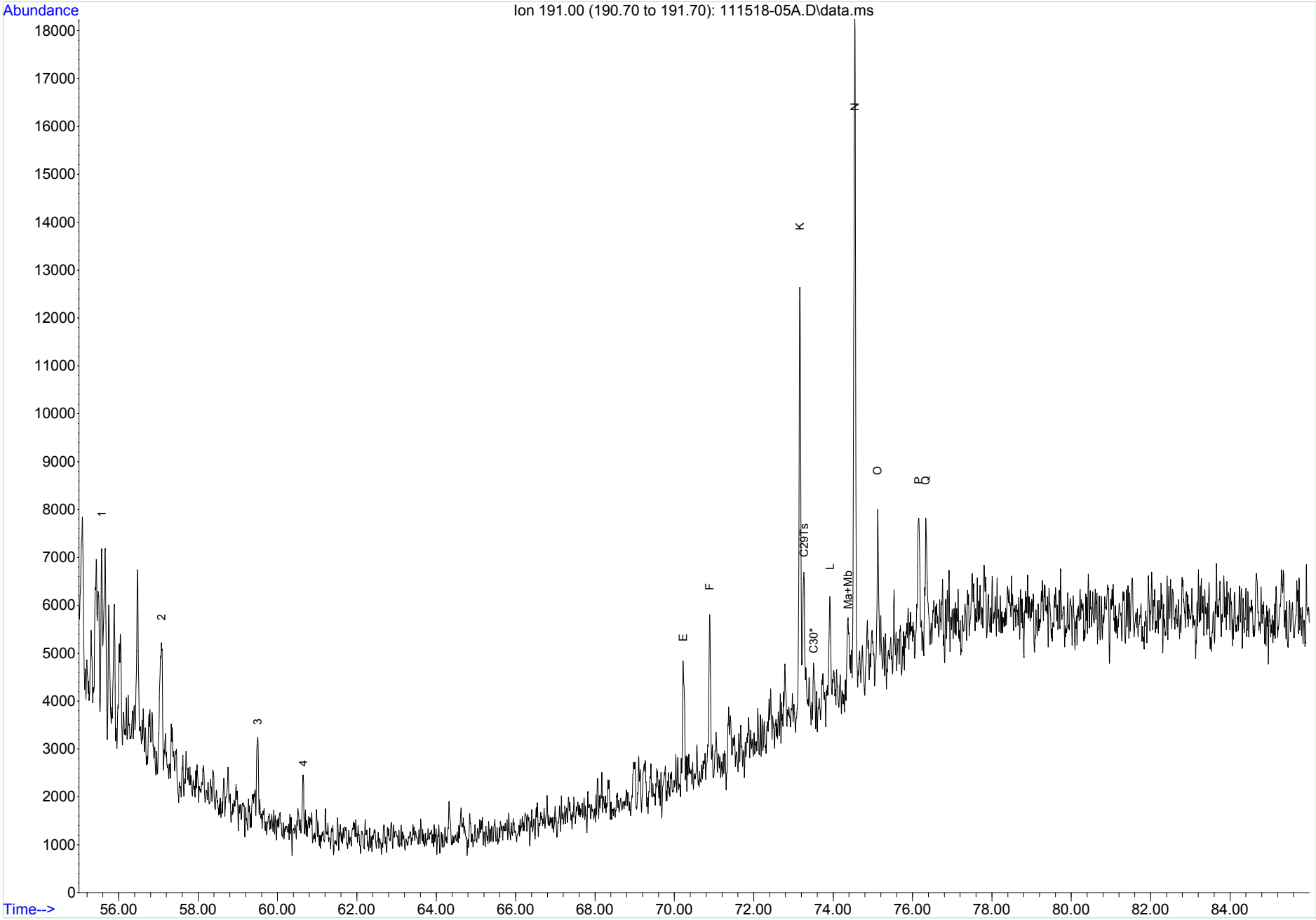
Project Manager:	A. Williams	Lab ID:	28678-1
Client:	EPS	Collected:	11/8/2018
Address:	400 Northridge Rd. Sandy Springs, GA 30350	Received:	11/12/2018
		Matrix:	Product
Project:	TRANSCO	Client ID:	18312-TW-24 1/10
Project #:		Analyzed:	11/16/2018
Collected by:		Q Method:	FSRTL111618B.M

Identity	Symbol	Ion (m/z)	Retention Time	Peak Height	Rel. Height % (191 m/z)
C_{21}-Tricyclic Terpane	1	191	55.6	3423.0	5.8%
C_{22}-Tricyclic Terpane	2	191	57.1	2743.0	4.6%
C_{23}-Tricyclic Terpane	3	191	59.5	5310.0	9.0%
C_{24}-Tricyclic Terpane	4	191	60.6	1295.0	2.2%
C_{25}-Tricyclic Terpane	5(S+R)	191	ND	ND	ND
C_{24}-Tetracyclic Terpane	Z4	191	ND	ND	ND
C_{26}-Tricyclic Terpane	6a*	191	ND	ND	ND
C_{26}-Tricyclic Terpane	6b	191	ND	ND	ND
C_{28}-Tricyclic Terpane #1	A	191	ND	ND	ND
C_{28}-Tricyclic Terpane #2	B	191	ND	ND	ND
C_{29}-Tricyclic Terpane #1	C	191	ND	ND	ND
C_{29}-Tricyclic Terpane #2	D	191	ND	ND	ND
18 α-22,29,30-Trisnorneohopane (Ts)	E	191	70.2	2500.0	4.2%
17 α-22,29,30-Trisnorhopane (Tm)	F	191	70.9	3444.0	5.8%
C_{30}-Tricyclic Terpane #1	10a*	191	ND	ND	ND
C_{30}-Tricyclic Terpane #2	10b	191	ND	ND	ND
17 α-28,30 Bisnorhopane	I	191	ND	ND	ND
C_{31}-Tricyclic Terpane #1	11a*	191	ND	ND	ND
17α-25-Norhopane	J	191	ND	ND	ND
C_{31}-Tricyclic Terpane #2	11b	191	ND	ND	ND
17 α,21β-30-Norhopane	K	191	73.2	9294.0	15.7%
18α-30-Norneohopane	C29Ts	191	73.3	2265.0	3.8%
17α-Diahopane	C30*	191	73.5	1372.0	2.3%
17β-21α-30-Normoretane	L	191	73.9	2243.0	3.8%
18α+18β-Oleanane	Ma+Mb	191	74.4	1730.0	2.9%
17α-21β-Hopane	N	191	74.5	13951.0	23.6%
17β-21α-Moretane	O	191	75.1	3689.0	6.2%
22S-17α,21β-30-Homohopane	P	191	76.2	2931.0	5.0%
22R-17α,21β-30-Homohopane	Q	191	76.3	2879.0	4.9%
Gammacerane	R	191	ND	ND	ND
22S-17α,21β-30-Bishomohopane	T	191	ND	ND	ND
22R-17α,21β-30-Bishomohopane	U	191	ND	ND	ND
22S-17α,21β-30-Bishomohopane	WS	191	ND	ND	ND
22R-17α,21β-Trishomohopane	WR	191	ND	ND	ND
22S-17α,21β-Tetrahomohopane	XS	191	ND	ND	ND
22R-17α,21β-Tetrahomohopane	XR	191	ND	ND	ND
22S-17α,21β-Pentahomohopane	YS	191	ND	ND	ND
22R-17α,21β-Pentahomohopane	YR	191	ND	ND	ND

0.4032g->10mL
FOREN4LA_RTL.M

Submitted by,
Pace Energy Services, LLC

28678-1 [18312-TW-24] 1/10
0.4032g->10mL



Chromatogram Key & Numerical Results: 191 m/z Terpanes

Pace Analytical® Energy Services™

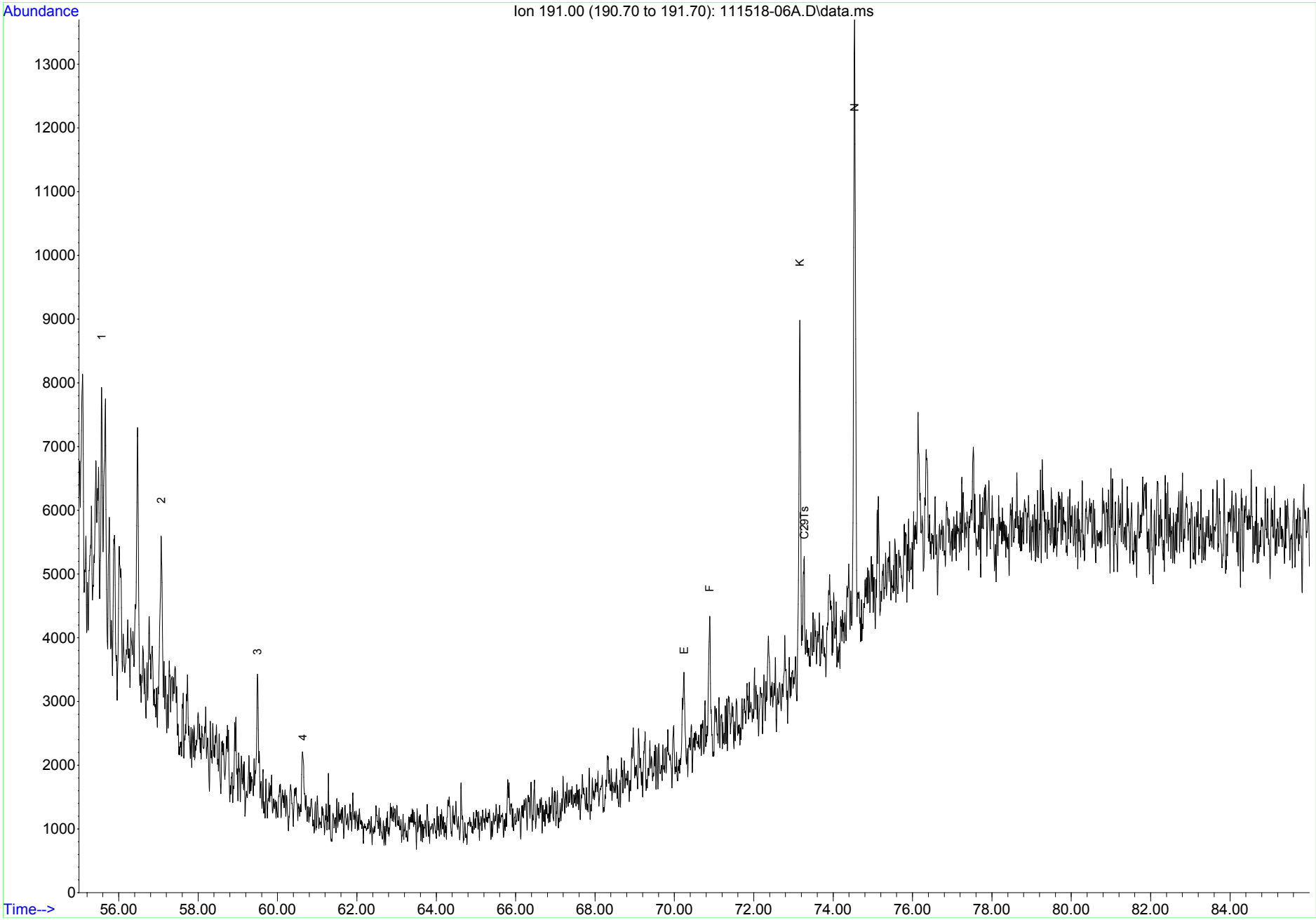
Project Manager:	A. Williams	Lab ID:	28678-6
Client:	EPS	Collected:	11/7/2018
Address:	400 Northridge Rd. Sandy Springs, GA 30350	Received:	11/12/2018
		Matrix:	Product
Project:	TRANSCO	Client ID:	18311-TW-18 1/10
Project #:		Analyzed:	11/17/2018
Collected by:		Q Method:	FSRTL111618B.M

Identity	Symbol	Ion (m/z)	Retention Time	Peak Height	Rel. Height % (191 m/z)
C_{21}-Tricyclic Terpane	1	191	55.6	3200.0	10.0%
C_{22}-Tricyclic Terpane	2	191	57.1	3001.0	9.4%
C_{23}-Tricyclic Terpane	3	191	59.5	4115.0	12.8%
C_{24}-Tricyclic Terpane	4	191	60.6	1093.0	3.4%
C_{25}-Tricyclic Terpane	5(S+R)	191	ND	ND	ND
C_{24}-Tetracyclic Terpane	Z4	191	ND	ND	ND
C_{26}-Tricyclic Terpane	6a*	191	ND	ND	ND
C_{26}-Tricyclic Terpane	6b	191	ND	ND	ND
C_{28}-Tricyclic Terpane #1	A	191	ND	ND	ND
C_{28}-Tricyclic Terpane #2	B	191	ND	ND	ND
C_{29}-Tricyclic Terpane #1	C	191	ND	ND	ND
C_{29}-Tricyclic Terpane #2	D	191	ND	ND	ND
18 α-22,29,30-Trisnorneohopane (Ts)	E	191	70.2	1453.0	4.5%
17 α-22,29,30-Trisnorhopane (Tm)	F	191	70.9	2189.0	6.8%
C_{30}-Tricyclic Terpane #1	10a*	191	ND	ND	ND
C_{30}-Tricyclic Terpane #2	10b	191	ND	ND	ND
17 α-28,30 Bisnorhopane	I	191	ND	ND	ND
C_{31}-Tricyclic Terpane #1	11a*	191	ND	ND	ND
17α-25-Norhopane	J	191	ND	ND	ND
C_{31}-Tricyclic Terpane #2	11b	191	ND	ND	ND
17 α,21β-30-Norhopane	K	191	73.2	5974.0	18.6%
18α-30-Norneohopane	C29Ts	191	73.3	1585.0	4.9%
17α-Diahopane	C30*	191	ND	ND	ND
17β-21α-30-Normoretane	L	191	ND	ND	ND
18α+18β-Oleanane	Ma+Mb	191	ND	ND	ND
17α-21β-Hopane	N	191	74.5	9479.0	29.5%
17β-21α-Moretane	O	191	ND	ND	ND
22S-17α,21β-30-Homohopane	P	191	ND	ND	ND
22R-17α,21β-30-Homohopane	Q	191	ND	ND	ND
Gammacerane	R	191	ND	ND	ND
22S-17α,21β-30-Bishomohopane	T	191	ND	ND	ND
22R-17α,21β-30-Bishomohopane	U	191	ND	ND	ND
22S-17α,21β-30-Bishomohopane	WS	191	ND	ND	ND
22R-17α,21β-Trishomohopane	WR	191	ND	ND	ND
22S-17α,21β-Tetrahomohopane	XS	191	ND	ND	ND
22R-17α,21β-Tetrahomohopane	XR	191	ND	ND	ND
22S-17α,21β-Pentahomohopane	YS	191	ND	ND	ND
22R-17α,21β-Pentahomohopane	YR	191	ND	ND	ND

0.4458g->10mL
FOREN4LA_RTL.M

Submitted by,
Pace Energy Services, LLC

28678-6 [18311-TW-18] 1/10
0.4458g->10mL



Chromatogram Key & Numerical Results: 217 m/z Steranes

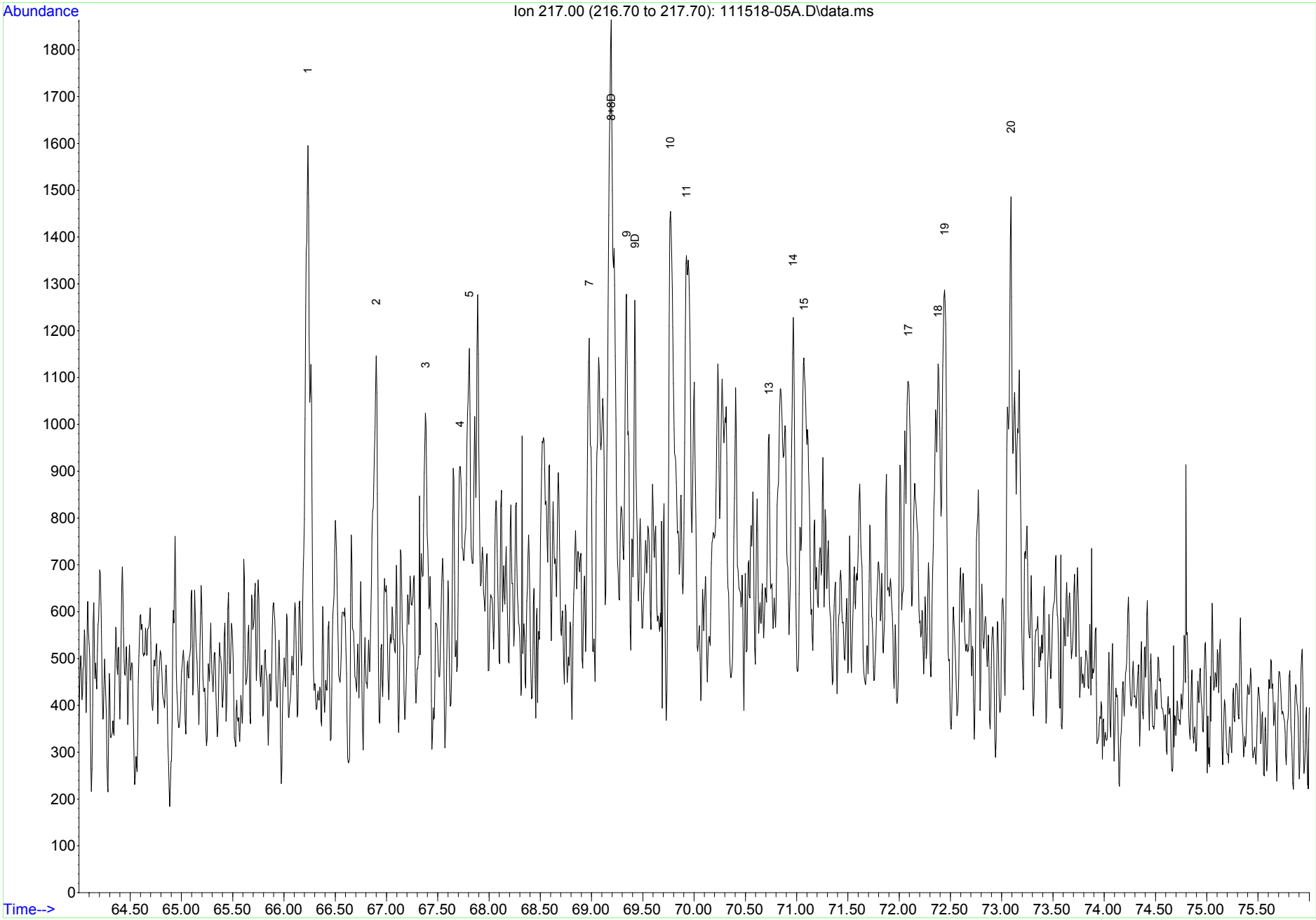
Project Manager:	A. Williams	Lab ID:	28678-1
Client:	EPS	Collected:	11/8/2018
Address:	400 Northridge Rd. Suite Sandy Springs, GA 30350	Received:	11/12/2018
		Matrix:	Product
Project:	TRANSCO	Client ID:	18312-TW-24 1/10
Project #:		Analyzed:	11/16/2018
Collected by:		Q Method:	FSRTL111618B.M

Identity	Symbol	Ion (m/z)	Retention Time	Peak Height	Rel. Height % (217 m/z)
13β, 17α-Diacholestane (20S)	1	217	66.2	1205.0	8.6%
13β, 17α-Diacholestane (20R)	2	217	66.9	784.0	5.6%
13α, 17β-Diacholestane (20S)	3	217	67.4	718.0	5.1%
13α, 17β-Diacholestane (20R)	4	217	67.7	438.0	3.1%
24-methyl-13β,17α-Diacholestane (20S)	5	217	67.8	579.0	4.1%
24-methyl-13β,17α-Diacholestane (20S)	6	217	ND	ND	ND
24-methyl-13α,17β-Diacholestane (20S)	7D	217	ND	ND	ND
14α,17α-Cholestane (20S)	7	217	69.0	733.0	5.2%
24-ethyl-13β, 17α-Diacholestane (20S)+	8+8D	217			
14β,17β-Cholestane (20R)			69.2	1260.0	9.0%
14β,17β-Cholestane (20S)	9	217	69.3	760.0	5.4%
24-methyl-13α,17β-Diacholestane (20R)	9D	217	69.4	641.0	4.6%
14α,17α-Cholestane (20R)	10	217	69.8	1087.0	7.8%
24-ethyl-13β, 17α-Diacholestane (20R)	11	217	69.9	718.0	5.1%
24-ethyl-13α, 17β-Diacholestane (20S)	12	217	ND	ND	ND
24-ethyl-13α, 17α-Diacholestane (20S)	13	217	70.7	435.0	3.1%
24-methyl-14β, 17β-Cholestane (20R)	14	217	71.0	756.0	5.4%
24-methyl-14β, 17β-Cholestane (20S)	15	217	71.1	670.0	4.8%
24-methyl-14α, 17α-Cholestane (20R)	16	217	ND	ND	ND
24-ethyl-14α-Cholestane (20S)	17	217	72.1	608.0	4.3%
24-ethyl-14β, 17β-Cholestane (20R)	18	217	72.4	601.0	4.3%
24-ethyl-14β, 17β-Cholestane (20S)	19	217	72.4	938.0	6.7%
24-ethyl-14α, 17α-Cholestane (20R)	20	217	73.1	1065.0	7.6%

0.4032*g*->10mL
FOREN4LA_RTL.M

Submitted by,
Pace Energy Services, LLC

28678-1 [18312-TW-24] 1/10
0.4032g->10mL



Chromatogram Key & Numerical Results: 217 m/z Steranes

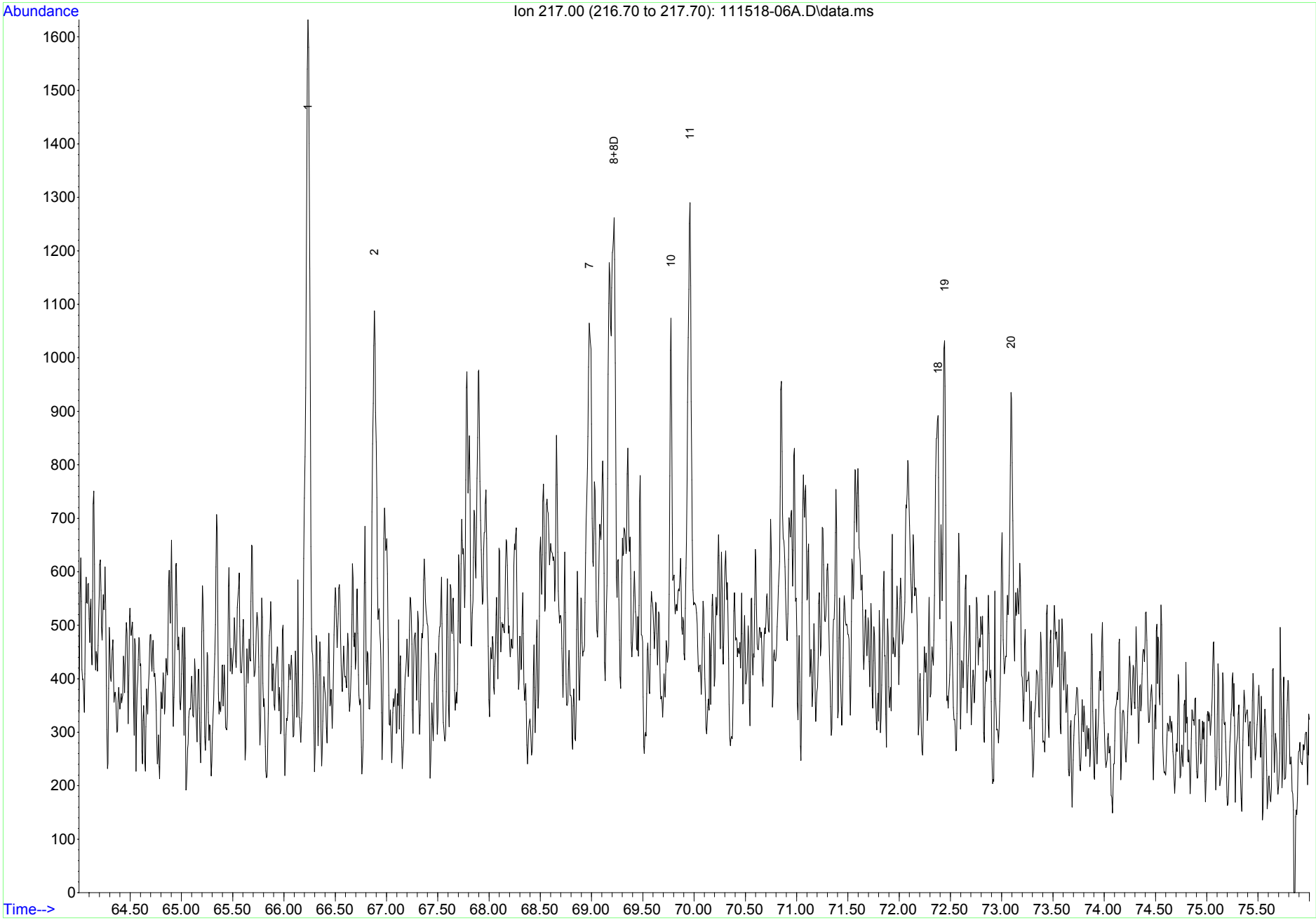
Project Manager:	A. Williams	Lab ID:	28678-6
Client:	EPS	Collected:	11/7/2018
Address:	400 Northridge Rd. Suite Sandy Springs, GA 30350	Received:	11/12/2018
		Matrix:	Product
Project:	TRANSCO	Client ID:	18311-TW-18 1/10
Project #:		Analyzed:	11/17/2018
Collected by:		Q Method:	FSRTL111618B.M

Identity	Symbol	Ion (m/z)	Retention Time	Peak Height	Rel. Height % (217 m/z)
13β, 17α-Diacholestane (20S)	1	217	66.2	1406.0	20.4%
13β, 17α-Diacholestane (20R)	2	217	66.9	839.0	12.1%
13α, 17β-Diacholestane (20S)	3	217	ND	ND	ND
13α, 17β-Diacholestane (20R)	4	217	ND	ND	ND
24-methyl-13β,17α-Diacholestane (20S)	5	217	ND	ND	ND
24-methyl-13β,17α-Diacholestane (20S)	6	217	ND	ND	ND
24-methyl-13α,17β-Diacholestane (20S)	7D	217	ND	ND	ND
14α,17α-Cholestane (20S)	7	217	69.0	614.0	8.9%
24-ethyl-13β, 17α-Diacholestane (20S)+	8+8D	217			
14β,17β-Cholestane (20R)			69.2	869.0	12.6%
14β,17β-Cholestane (20S)	9	217	ND	ND	ND
24-methyl-13α,17β-Diacholestane (20R)	9D	217	ND	ND	ND
14α,17α-Cholestane (20R)	10	217	69.8	643.0	9.3%
24-ethyl-13β, 17α-Diacholestane (20R)	11	217	70.0	877.0	12.7%
24-ethyl-13α, 17β-Diacholestane (20S)	12	217	ND	ND	ND
24-ethyl-13α, 17α-Diacholestane (20S)	13	217	ND	ND	ND
24-methyl-14β, 17β-Cholestane (20R)	14	217	ND	ND	ND
24-methyl-14β, 17β-Cholestane (20S)	15	217	ND	ND	ND
24-methyl-14α, 17α-Cholestane (20R)	16	217	ND	ND	ND
24-ethyl-14α-Cholestane (20S)	17	217	ND	ND	ND
24-ethyl-14β, 17β-Cholestane (20R)	18	217	72.4	467.0	6.8%
24-ethyl-14β, 17β-Cholestane (20S)	19	217	72.4	687.0	9.9%
24-ethyl-14α, 17α-Cholestane (20R)	20	217	73.1	504.0	7.3%

0.4458g->10mL
FOREN4LA_RTL.M

Submitted by,
Pace Energy Services, LLC

28678-6 [18311-TW-18] 1/10
0.4458g->10mL



Chromatogram Key & Numerical Results: 253 m/z Monoaromatic Steranes

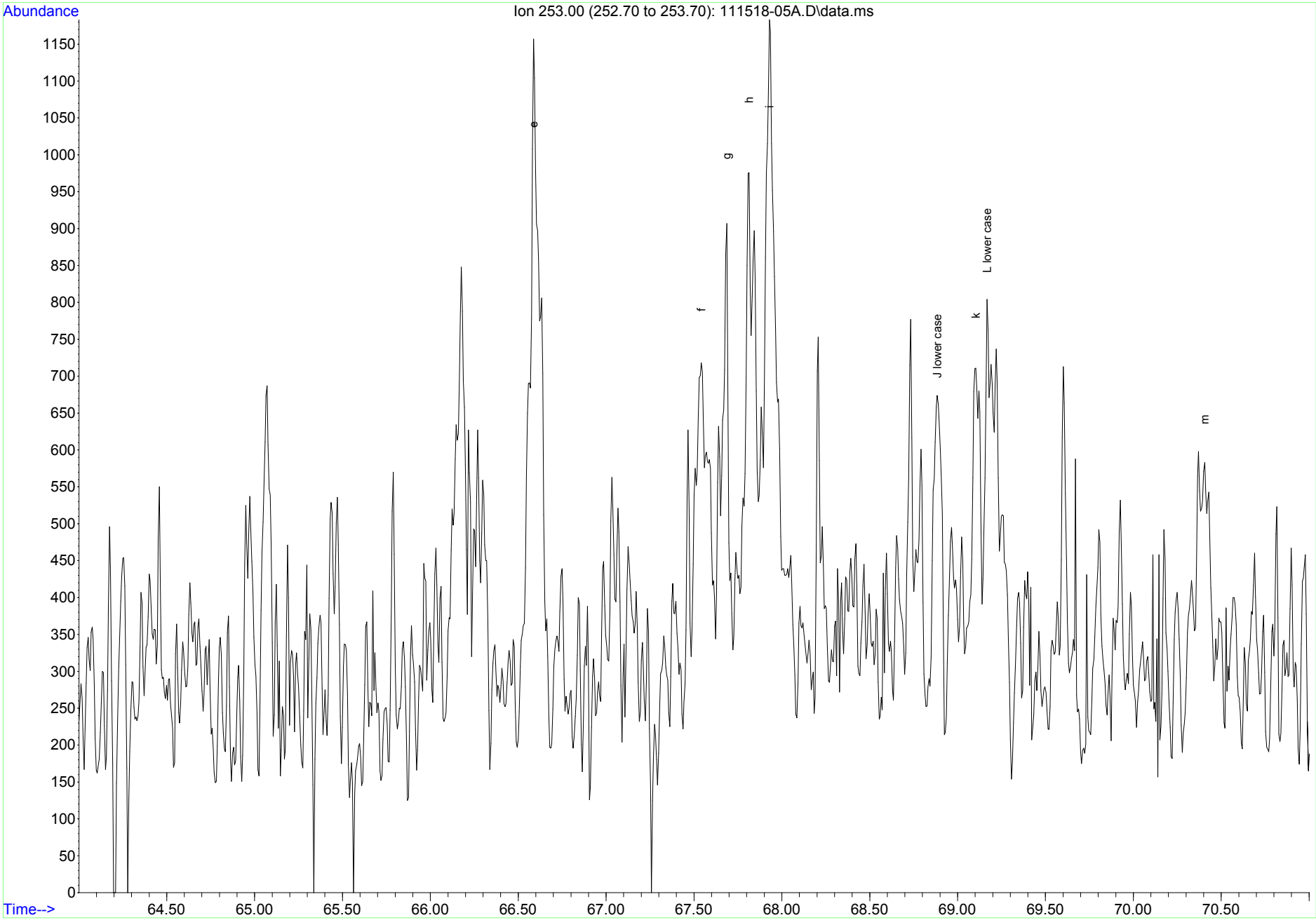
Project Manager:	A. Williams	Lab ID:	28678-1
Client:	EPS	Collected:	11/8/2018
Address:	400 Northridge Rd. Suite Sandy Springs, GA 30350	Received:	11/12/2018
		Matrix:	Product
Project:	TRANSCO	Client ID:	18312-TW-24 1/10
Project #:		Analyzed:	11/16/2018
Collected by:		Q Method:	FSRTL111618B.M

Identity	Symbol	Ion (m/z)	Retention Time	Peak Height	Rel. Height % (253 m/z)
20S, 5β C27-MAS	a	253	ND	ND	ND
20S, dia C27-MAS	b	253	ND	ND	ND
20R, 5β C27-MAS + 20R C27 dia MAS	c	253	ND	ND	ND
20S, 5α C27-MAS	d	253	ND	ND	ND
20R, 5β C28-MAS + 20S C28 dia MAS	e	253	66.6	961.0	20.1%
20R, 5α C27-MAS	f	253	67.5	398.0	8.3%
20S, 5α C28-MAS	g	253	67.7	578.0	12.1%
20R, 5β C28-MAS + 20R C28 dia MAS	h	253	67.8	571.0	11.9%
20S, 5β C29-MAS + 20S C29 dia MAS	i	253	67.9	753.0	15.7%
20S, 5α C29-MAS	J lower case	253	68.9	457.0	9.6%
20R, 5α C28-MAS	k	253	69.1	344.0	7.2%
20R, 5β C29-MAS + 20R C29 dia MAS	L lower case	253	69.2	421.0	8.8%
20R, 5α C29-MAS	m	253	70.4	301.0	6.3%

0.4032g->10mL
FOREN4LA_RTL.M

Submitted by,
Pace Energy Services, LLC

28678-1 [18312-TW-24] 1/10
0.4032g->10mL



Chromatogram Key & Numerical Results: 253 m/z Monoaromatic Steranes

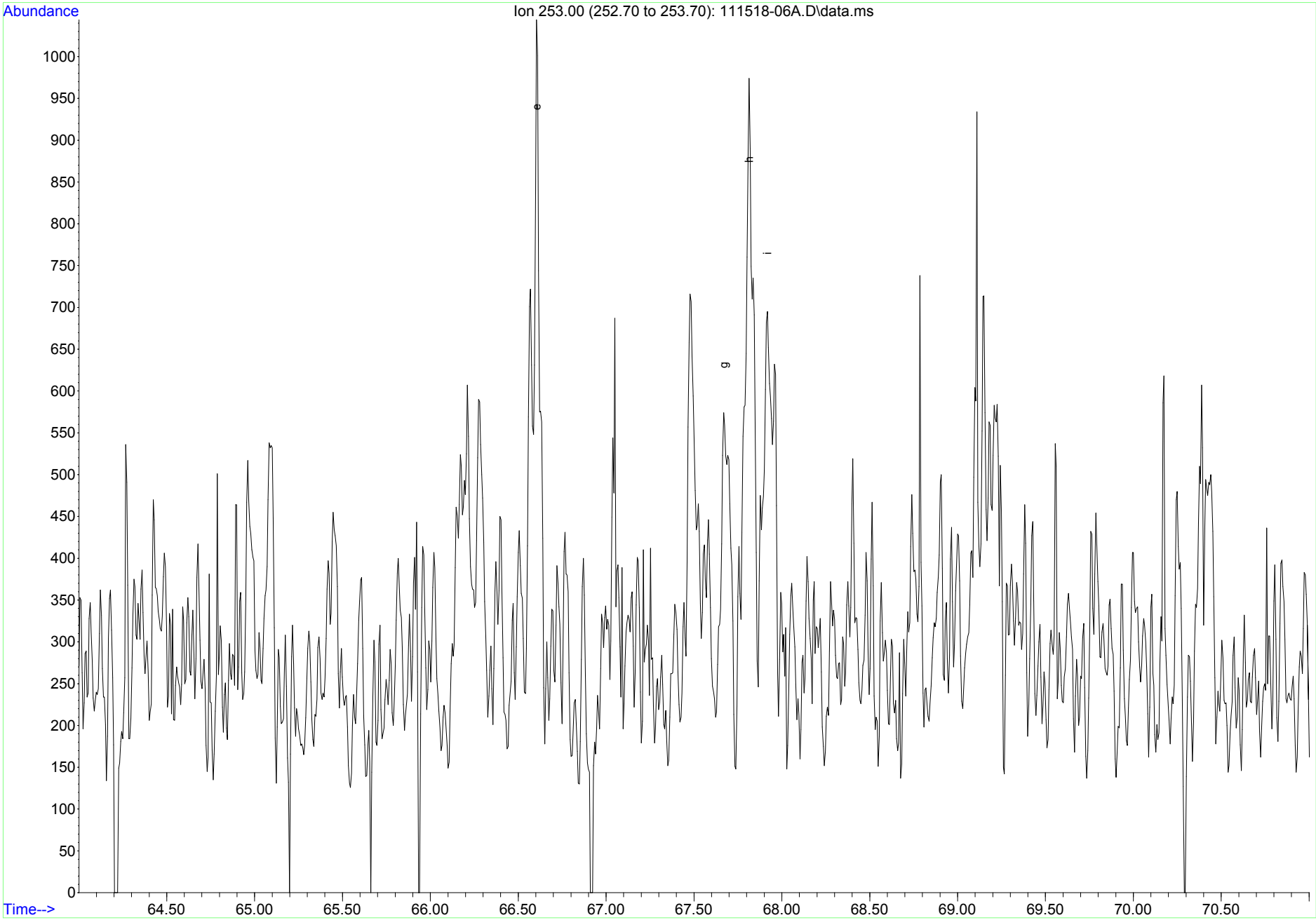
Project Manager:	A. Williams	Lab ID:	28678-6
Client:	EPS	Collected:	11/7/2018
Address:	400 Northridge Rd. Suite Sandy Springs, GA 30350	Received:	11/12/2018
		Matrix:	Product
Project:	TRANSCO	Client ID:	18311-TW-18 1/10
Project #:		Analyzed:	11/17/2018
Collected by:		Q Method:	FSRTL111618B.M

Identity	Symbol	Ion (m/z)	Retention Time	Peak Height	Rel. Height % (253 m/z)
20S, 5β C27-MAS	a	253	ND	ND	ND
20S, dia C27-MAS	b	253	ND	ND	ND
20R, 5β C27-MAS + 20R C27 dia MAS	c	253	ND	ND	ND
20S, 5α C27-MAS	d	253	ND	ND	ND
20R, 5β C28-MAS + 20S C28 dia MAS	e	253	66.6	866.0	35.1%
20R, 5α C27-MAS	f	253	ND	ND	ND
20S, 5α C28-MAS	g	253	67.7	426.0	17.3%
20R, 5β C28-MAS + 20R C28 dia MAS	h	253	67.8	728.0	29.5%
20S, 5β C29-MAS + 20S C29 dia MAS	i	253	67.9	449.0	18.2%
20S, 5α C29-MAS	J lower case	253	ND	ND	ND
20R, 5α C28-MAS	k	253	ND	ND	ND
20R, 5β C29-MAS + 20R C29 dia MAS	L lower case	253	ND	ND	ND
20R, 5α C29-MAS	m	253	ND	ND	ND

0.4458g->10mL
FOREN4LA_RTL.M

Submitted by,
Pace Energy Services, LLC

28678-6 [18311-TW-18] 1/10
0.4458g->10mL



Chromatogram Key & Numerical Results: 231 m/z Triaromatic Steranes

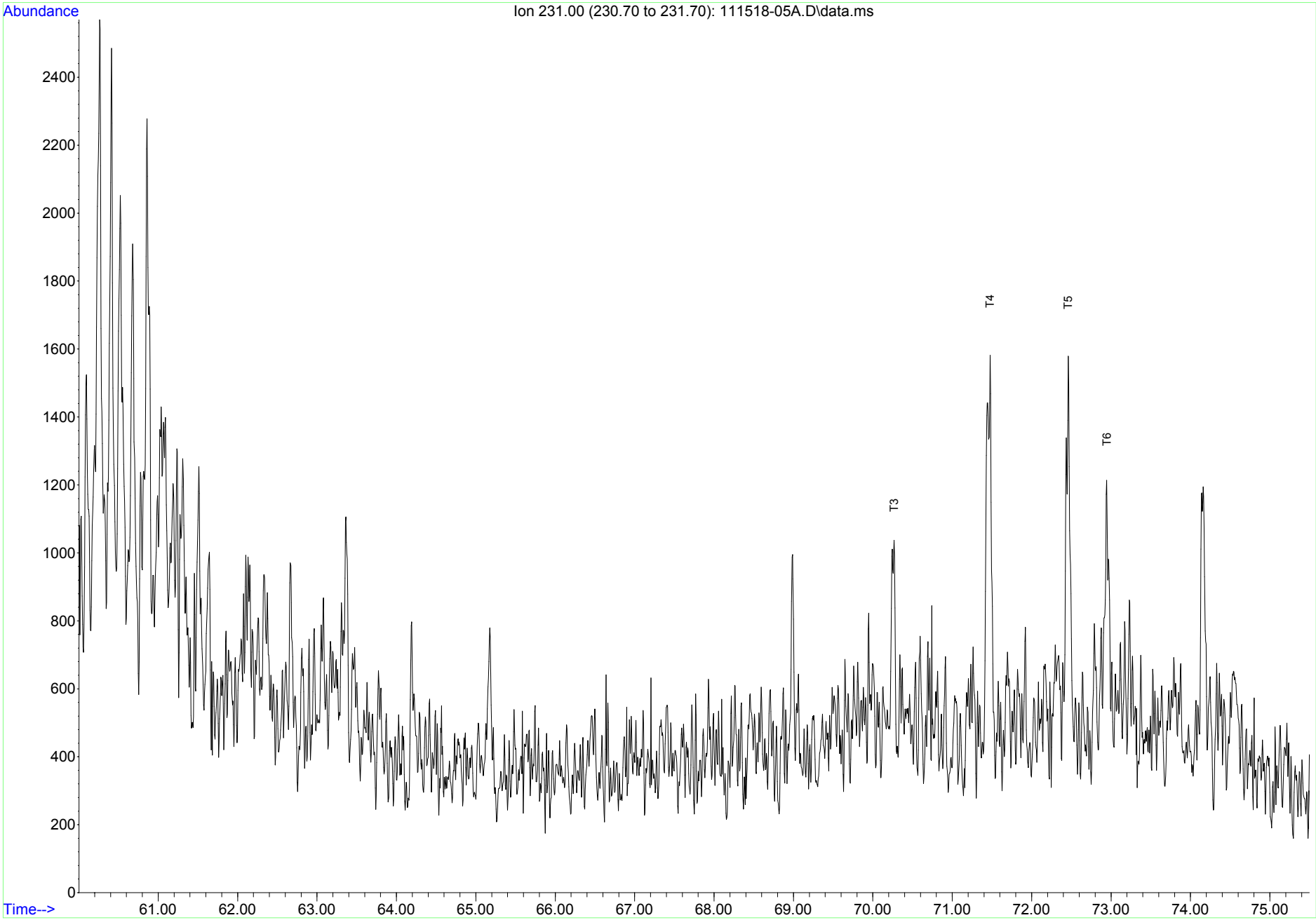
Project Manager:	A. Williams	Lab ID:	28678-1
Client:	EPS	Collected:	11/8/2018
Address:	400 Northridge Rd. Suite Sandy Springs, GA 30350	Received: Matrix:	11/12/2018 Product
Project:	TRANSCO	Client ID:	18312-TW-24 1/10
Project #:		Analyzed:	11/16/2018
Collected by:		Q Method:	FSRTL111618B.M

Identity	Symbol	Ion (m/z)	Retention Time	Peak Height	Rel. Height % (231 m/z)
C_{20} Triaromatic Sterane	T1	231	ND	ND	ND
C_{21} Triaromatic Sterane	T2	231	ND	ND	ND
20S C_{26} Triaromatic Sterane	T3	231	70.3	625.0	13.6%
20R C_{26} + 20S C_{27} Triaromatic Steranes	T4	231	71.5	1254.0	27.4%
20S C_{28} Triaromatic Sterane	T5	231	72.5	1184.0	25.9%
20R C_{27} Triaromatic Sterane	T6	231	73.0	719.0	15.7%
20R C_{28} Triaromatic Sterane	T7	231	74.2	797.0	17.4%

0.4032g->10mL
FOREN4LA_RTL.M

Submitted by,
Pace Energy Services, LLC

28678-1 [18312-TW-24] 1/10
0.4032g->10mL



Chromatogram Key & Numerical Results: 231 m/z Triaromatic Steranes

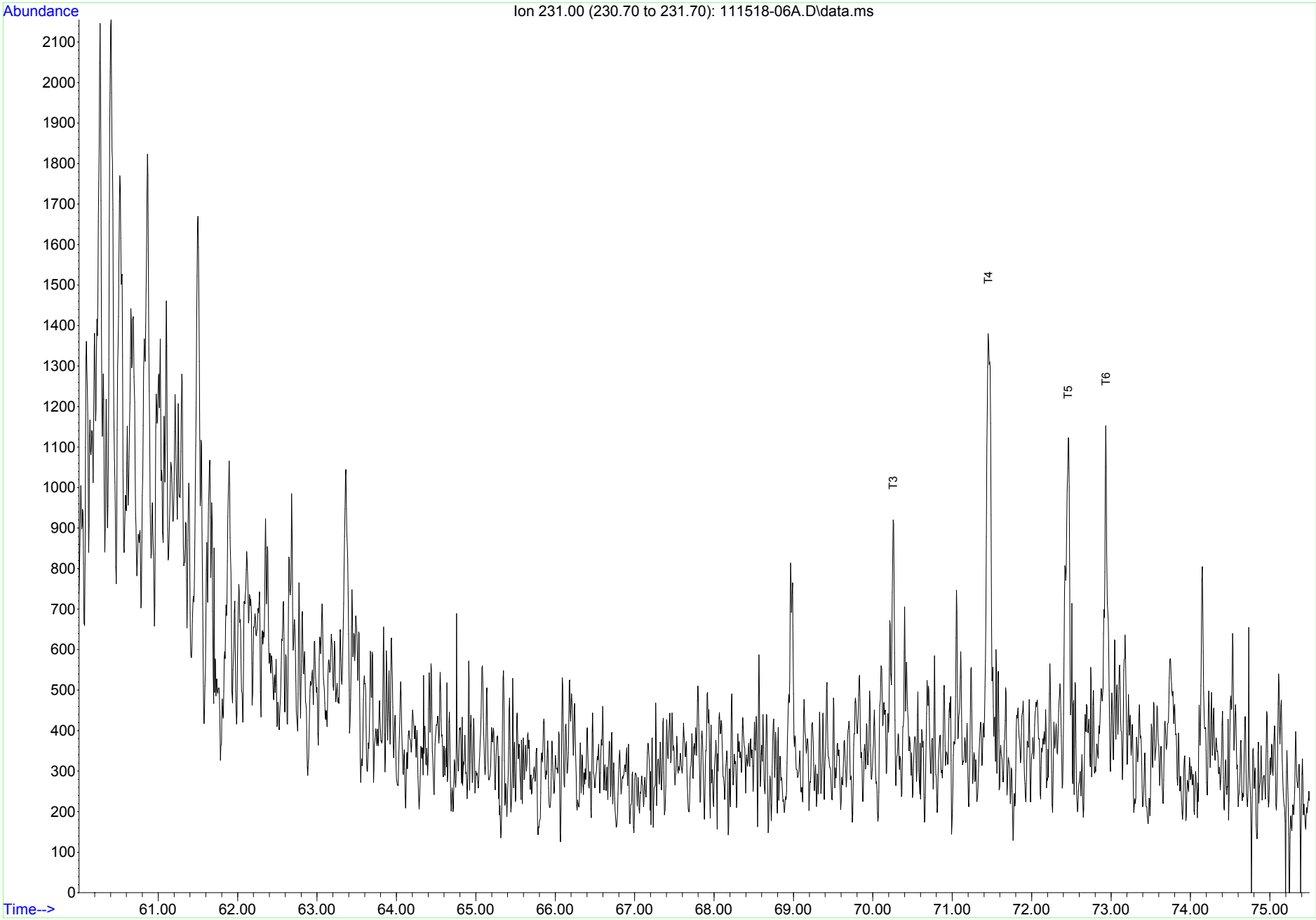
Project Manager:	A. Williams	Lab ID:	28678-6
Client:	EPS	Collected:	11/7/2018
Address:	400 Northridge Rd. Suite Sandy Springs, GA 30350	Received: Matrix:	11/12/2018 Product
Project:	TRANSCO	Client ID:	18311-TW-18 1/10
Project #:		Analyzed:	11/17/2018
Collected by:		Q Method:	FSRTL111618B.M

Identity	Symbol	Ion (m/z)	Retention Time	Peak Height	Rel. Height % (231 m/z)
C_{20} Triaromatic Sterane	T1	231	ND	ND	ND
C_{21} Triaromatic Sterane	T2	231	ND	ND	ND
20S C_{26} Triaromatic Sterane	T3	231	70.3	656.0	16.2%
20R C_{26} + 20S C_{27} Triaromatic Steranes	T4	231	71.5	1065.0	26.3%
20S C_{28} Triaromatic Sterane	T5	231	72.5	865.0	21.4%
20R C_{27} Triaromatic Sterane	T6	231	72.9	881.0	21.8%
20R C_{28} Triaromatic Sterane	T7	231	74.2	577.0	14.3%

0.4458g->10mL
FOREN4LA_RTL.M

Submitted by,
Pace Energy Services, LLC

28678-6 [18311-TW-18] 1/10
0.4458g->10mL



Pace Analytical® Energy Services™

Key for Identifying Aromatic Hydrocarbons

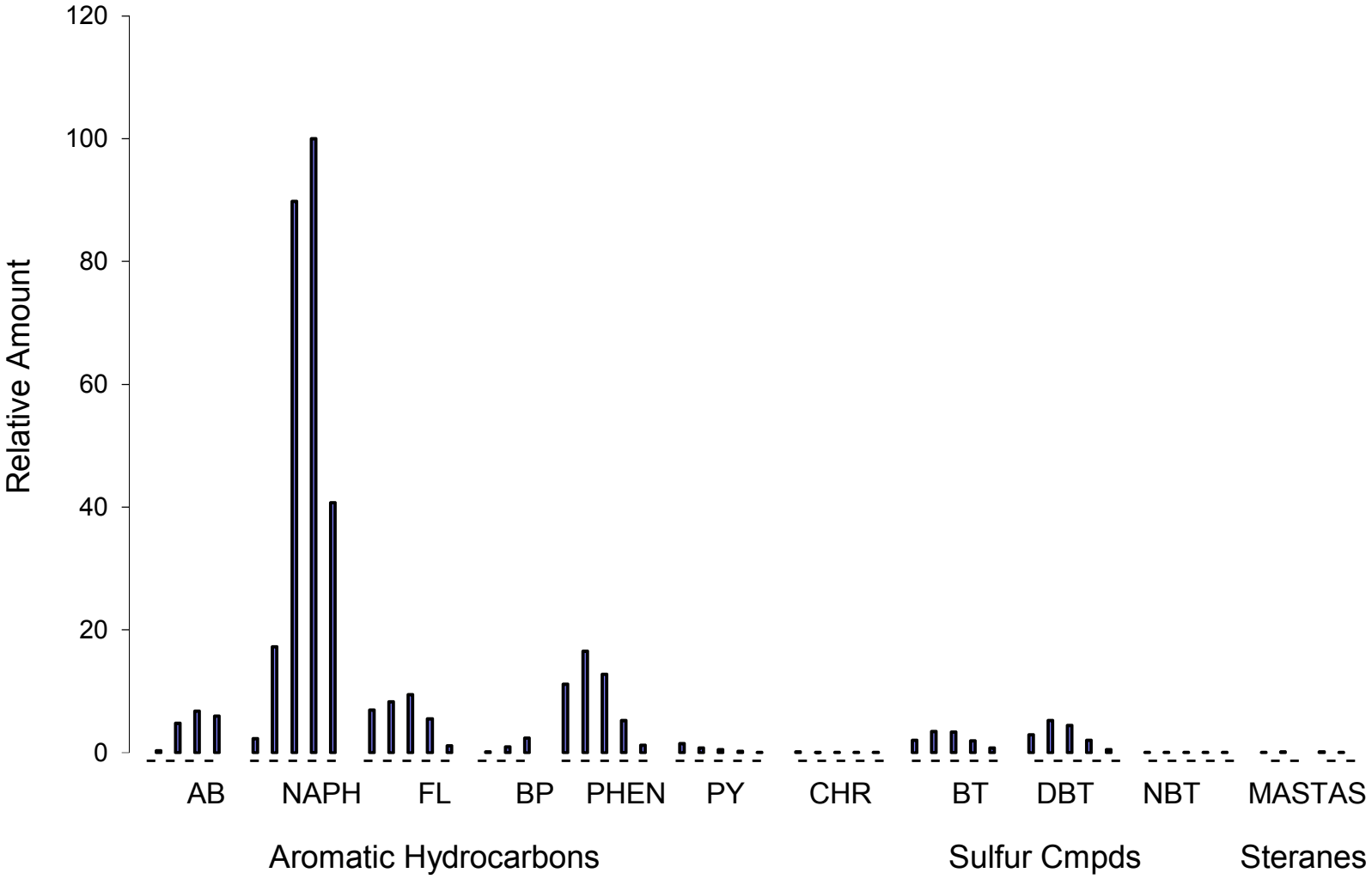
No	m/z	Abbreviation	Compound
1	120	AB	C_3-alkylbenzenes
2	134		C_4-alkylbenzenes
3	148		C_5-alkylbenzenes
4	162		C_6-alkylbenzenes
5	128	NAPH	C_0-naphthalene
6	142		C_1-naphthalenes
7	156		C_2-naphthalenes
8	170		C_3-naphthalenes
9	184		C_4-naphthalenes
10	166	FL	C_0-fluorene
11	180		C_1-fluorenes
12	194		C_2-fluorenes
13	208		C_3-fluorenes
14	222		C_4-fluorenes
15	154	BP	C_0-biphenyl
16	168		C_1-biphenyls + dibenzofuran
17	182		C_2-biphenyls + C1 Dibenzofuran
18	178	PHEN	C_0-phenanthrene
19	192		C_1-phenanthrenes
20	206		C_2-phenanthrenes
21	220		C_3-phenanthrenes
22	234		C_4-phenanthrenes
23	202	PY	C_0-pyrene/fluoranthene
24	216		C_1-pyrenes/fluoranthenes
25	230		C_2-pyrenes/fluoranthenes
26	244		C_3-pyrenes/fluoranthenes
27	258		C_4-pyrenes/fluoranthenes
28	228	CHR	C_0-chrysene
29	242		C_1-chrysenes
30	256		C_2-chrysenes
31	270		C_3-chrysenes
32	284		C_4-chrysenes
33	148	BT	C_1-benzothiophenes
34	162		C_2-benzothiophenes
35	176		C_3-benzothiophenes
36	190		C_4-benzothiophenes
37	204		C_5-benzothiophenes

Key for Identifying Aromatic Hydrocarbons – Cont.

No	m/z	Abbreviation	Compound
38	184	DBT	C_0-dibenzothiophene
39	198		C_1-dibenzothiophenes
40	212		C_2-dibenzothiophenes
41	226		C_3-dibenzothiophenes
42	240		C_4-dibenzothiophenes
43	234	NBT	C_0-naphthobenzthiophene
44	248		C_1-naphthobenzthiophenes
45	262		C_2-naphthobenzthiophenes
46	276		C_3-naphthobenzthiophenes
47	290		C_4-naphthobenzthiophenes
48	253	MAS	Monoaromatic steranes
49	267		Monoaromatic steranes
50	239		Monoaromatic steranes
51	231	TAS	Triaromatic steranes
52	245		Triaromatic steranes

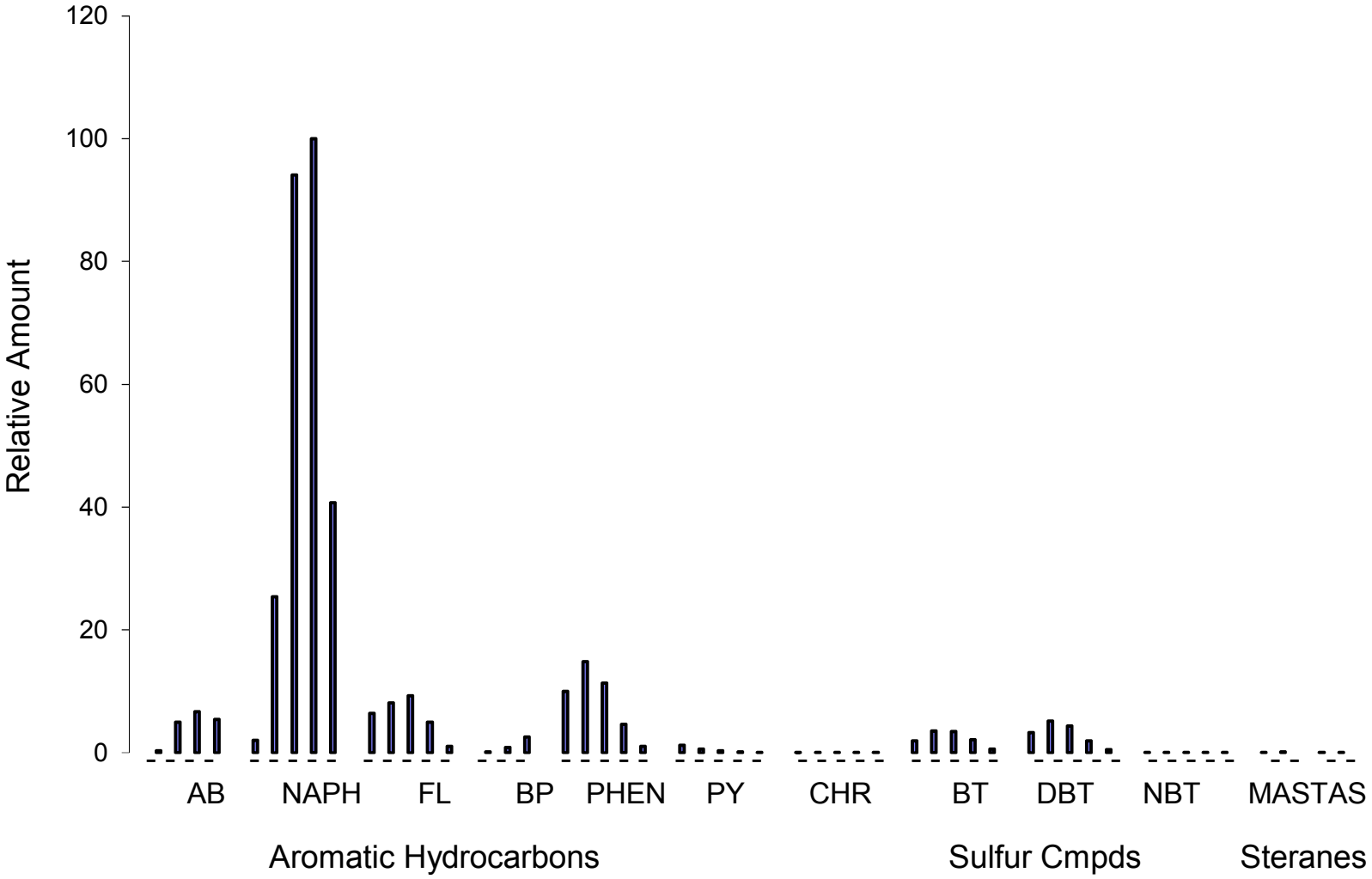
Aromatic Hydrocarbon Distribution

28678-1 [18312-TW-24] 1/10



Aromatic Hydrocarbon Distribution

28678-6 [18311-TW-18] 1/10



Quality Monitoring Form

Project Manager:	A. Williams	Lab ID:	28678-1
Client:	EPS		
		Collected:	11/8/2018
Address:	400 Northridge Rd. Suite Sandy Springs, GA 30350	Received:	11/12/2018
		Matrix:	Product
Project:	TRANSCO	Client ID:	18312-TW-24 1/10
Project #:		Analyzed:	11/16/2018
Collected by:		Q Method:	FSRTL111618B.M

Identity	R.T.	Expected R.T.	Qualifier
o-Terphenyl	49.2	49.2	
Naphthalene (d8)	27.7	27.7	
Acenapthene (d10)	37.8	37.8	
Phenanthrene (d10)	46.3	46.3	
Chrysene (d12)	61.6	61.7	
Perylene (d12)	69.2	69.3	
Mass Discrimination Ratio 1	1.4		
Mass Discrimination Ratio 2	0.6		
Mass Discrimination Ratio 3	0.23		

Q - Retention time qualifier
M-Mass discrimination qualifier

FOREN4LA_RTL.M
0.4032g->10mL

Submitted by,
Pace Energy Services, LLC

Quality Monitoring Form

Project Manager:	A. Williams	Lab ID:	28678-6
Client:	EPS		
		Collected:	11/7/2018
Address:	400 Northridge Rd. Suite Sandy Springs, GA 30350	Received:	11/12/2018
		Matrix:	Product
Project:	TRANSCO	Client ID:	18311-TW-18 1/10
Project #:		Analyzed:	11/17/2018
Collected by:		Q Method:	FSRTL111618B.M

Identity	R.T.	Expected R.T.	Qualifier
o-Terphenyl	49.2	49.2	
Naphthalene (d8)	27.7	27.7	
Acenapthene (d10)	37.8	37.8	
Phenanthrene (d10)	46.3	46.3	
Chrysene (d12)	61.6	61.7	
Perylene (d12)	69.2	69.3	
Mass Discrimination Ratio 1	1.4		
Mass Discrimination Ratio 2	0.6		
Mass Discrimination Ratio 3	0.28		

Q - Retention time qualifier
M-Mass discrimination qualifier

FOREN4LA_RTL.M
0.4458g->10mL

Submitted by,
Pace Energy Services, LLC

Subcontracted Analyses

Pace Analytical Energy Services
Contact: Ruth Welsh
Address: 220 William Pitt Way
Pittsburgh, PA 15238
Ph: 412-826-4482 Fax: 412-826-3433
Email: Ruth.Welsh@pacelabs.com

FINAL REPORT
This report and the data within has completed QA/QC review

CLARK TESTING
Fuels & Lubrication Lab
1801 Route 51 South
Building 9
Jefferson Hills, PA 15025
Ph: 412-387-1001
Fax: 412-387-1028

Primary Contact	Pittsburgh, PA
PO#	28678
Tracking #	409952-1
Client Sample #	286780001 18312-TW-24
Received Date	11/15/2018

General Diagnostic Notes

Additional detail may be available if requested, at standard Clark consulting rates.

Kinematic Viscosity (40C, 100C, and VI) - new oil

Test Code: D445 / Method: D445/D2270

Result Date	11/19/2018
Viscosity @ 40C	3.6951 cSt
Viscosity @ 100C	1.3650 cSt
Viscosity Index	0

Authorized Signature

Analyst: Pat Stockton Date: 11/19/2018

Pat Stockton

Pace Analytical Energy Services
Contact: Ruth Welsh
Address: 220 William Pitt Way
Pittsburgh, PA 15238
Ph: 412-826-4482 Fax: 412-826-3433
Email: Ruth.Welsh@pacelabs.com

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Building 9
Jefferson Hills, PA 15025
Ph: 412-387-1001
Fax: 412-387-1028

Primary Contact	Pittsburgh, PA
PO#	28678
Tracking #	409952-2
Client Sample #	286780002 18312-EW-13
Received Date	11/15/2018

General Diagnostic Notes

Additional detail may be available if requested, at standard Clark consulting rates.

Kinematic Viscosity (40C, 100C, and VI) - new oil

Test Code: D445 / Method: D445/D2270

Result Date	11/19/2018
Viscosity @ 40C	4.0507 cSt
Viscosity @ 100C	1.4532 cSt
Viscosity Index	0

Authorized Signature

Analyst: Pat Stockton Date: 11/19/2018

Pat Stockton

Pace Analytical Energy Services
Contact: Ruth Welsh
Address: 220 William Pitt Way
Pittsburgh, PA 15238
Ph: 412-826-4482 Fax: 412-826-3433
Email: Ruth.Welsh@pacelabs.com

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Building 9
Jefferson Hills, PA 15025
Ph: 412-387-1001
Fax: 412-387-1028

Primary Contact	Pittsburgh, PA
PO#	28678
Tracking #	409952-3
Client Sample #	286780003 18311-TW-19
Received Date	11/15/2018

General Diagnostic Notes

Additional detail may be available if requested, at standard Clark consulting rates.

Kinematic Viscosity (40C, 100C, and VI) - new oil

Test Code: D445 / Method: D445/D2270

Result Date	11/19/2018
Viscosity @ 40C	3.6600 cSt
Viscosity @ 100C	1.3549 cSt
Viscosity Index	0

Authorized Signature

Analyst: Pat Stockton Date: 11/19/2018

Pat Stockton

Pace Analytical Energy Services
Contact: Ruth Welsh
Address: 220 William Pitt Way
Pittsburgh, PA 15238
Ph: 412-826-4482 Fax: 412-826-3433
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Fuels & Lubrication Lab
1801 Route 51 South
Building 9
Jefferson Hills, PA 15025
Ph: 412-387-1001
Fax: 412-387-1028

Primary Contact	Pittsburgh, PA
PO#	28678
Tracking #	409952-4
Client Sample #	286780004 18312-EW-10
Received Date	11/15/2018

General Diagnostic Notes

Additional detail may be available if requested, at standard Clark consulting rates.

Kinematic Viscosity (40C, 100C, and VI) - new oil

Test Code: D445 / Method: D445/D2270

Result Date	11/19/2018
Viscosity @ 40C	3.7426 cSt
Viscosity @ 100C	1.3594 cSt
Viscosity Index	0

Authorized Signature

Analyst: Pat Stockton Date: 11/19/2018

Pat Stockton

Pace Analytical Energy Services
Contact: Ruth Welsh
Address: 220 William Pitt Way
Pittsburgh, PA 15238
Ph: 412-826-4482 Fax: 412-826-3433
Email: Ruth.Welsh@pacelabs.com

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Fuels & Lubrication Lab
1801 Route 51 South
Building 9
Jefferson Hills, PA 15025
Ph: 412-387-1001
Fax: 412-387-1028

Primary Contact	Pittsburgh, PA
PO#	28678
Tracking #	409952-5
Client Sample #	286780005 18310-TW-12
Received Date	11/15/2018

General Diagnostic Notes

Additional detail may be available if requested, at standard Clark consulting rates.

Kinematic Viscosity (40C, 100C, and VI) - new oil

Test Code: D445 / Method: D445/D2270

Result Date	11/19/2018
Viscosity @ 40C	3.7424 cSt
Viscosity @ 100C	1.3828 cSt
Viscosity Index	0

Authorized Signature

Analyst: Pat Stockton Date: 11/19/2018

Pat Stockton

Pace Analytical Energy Services
Contact: Ruth Welsh
Address: 220 William Pitt Way
Pittsburgh, PA 15238
Ph: 412-826-4482 Fax: 412-826-3433
Email: Ruth.Welsh@pacelabs.com

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1801 Route 51 South
Building 9
Jefferson Hills, PA 15025
Ph: 412-387-1001
Fax: 412-387-1028

Primary Contact	Pittsburgh, PA
PO#	28678
Tracking #	409952-6
Client Sample #	286780006 18311-TW-18
Received Date	11/15/2018

General Diagnostic Notes

Additional detail may be available if requested, at standard Clark consulting rates.

Kinematic Viscosity (40C, 100C, and VI) - new oil

Test Code: D445 / Method: D445/D2270

Result Date	11/19/2018
Viscosity @ 40C	3.5897 cSt
Viscosity @ 100C	1.3447 cSt
Viscosity Index	0

Authorized Signature

Analyst: Pat Stockton Date: 11/19/2018

Pat Stockton

Pace Analytical Energy Services
Contact: Ruth Welsh
Address: 220 William Pitt Way
Pittsburgh, PA 15238
Ph: 412-826-4482 Fax: 412-826-3433
Email: Ruth.Welsh@pacelabs.com

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Fuels & Lubrication Lab
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Building 9
Jefferson Hills, PA 15025
Ph: 412-387-1001
Fax: 412-387-1028

Primary Contact	Pittsburgh, PA
PO#	28678
Tracking #	409952-7
Client Sample #	286780007 18310-TW-20
Received Date	11/15/2018

General Diagnostic Notes

Additional detail may be available if requested, at standard Clark consulting rates.

Kinematic Viscosity (40C, 100C, and VI) - new oil

Test Code: D445 / Method: D445/D2270

Result Date	11/19/2018
Viscosity @ 40C	3.5782 cSt
Viscosity @ 100C	1.4820 cSt
Viscosity Index	0

Authorized Signature

Analyst: Pat Stockton Date: 11/19/2018

Pat Stockton

Pace Analytical®
www.pacelabs.com

220 William Pitt Way
Pittsburgh, PA 15238
412-826-5245

28678

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

013440

Section A Required Client Information:

Company: EPS	
Address: 400 Northridge Rd. Ste. 400	
Sandy Springs, GA 30350	
Email To: awilliams@envplanning.com	
Phone: 404-315-9113 Fax:	
Requested Due Date/TAT:	

Section B Required Project Information:

Report To: awilliams@envplanning.com	
Copy To:	
Purchase Order No.:	
Project Name: TRANSCO	
Project Number:	

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY

NPDES GROUND WATER DRINKING WATER
UST RCRA OTHER _____

Site Location STATE: GA

Section D Required Client Information

Matrix Codes MATRIX / CODE

Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	TSP	BAK	Zinc Acetate & NaOH	Other	Analysis Test Y/N	ASTM-D945-Visc.	ASTM-D5739	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	18312-TW-24	P	G			11/8/18	0955		2	✓								✓	✓			
2	18312-EW-13	P	G			11/8/18	0810		2	✓								✓				
3	18311-TW-19	P	G			11/7/18	0815		2	✓								✓				
4	18312-EW-10	P	G			11/8/18	0845		2	✓								✓				
5	18310-TW-12	P	G			11/6/18	1550		2	✓								✓				
6	18311-TW-18	P	G			11/7/18	0815		2	✓								✓	✓			
7	18310-TW-20	P	G			11/6/18	1545		2	✓								✓				
8																						
9																						
10																						
11																						
12																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
ITEM #s 2,3,4,5,7	BM / EPS	11/9/18	1135	M Lahman Pace ATL	11/09/18	1135				
hold for ASTM D5379	Charles Hanks	11/9/18	1700	Leon PACE	11.12.18	1040	2.7	J	N	
							5.4	Y	Y	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Brian McGann

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 11/09/18

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Cooler Receipt Form

Client Name: EPS **Project:** Transco **Lab Work Order:** 28678

A. **Shipping/Container Information** (circle appropriate response)

Courier: (FedEx) UPS USPS Client Other:_____ **Air bill Present:** (Yes) No

Tracking Number: 449494053191

Custody Seal on Cooler/Box Present: Yes No **Seals Intact:** Yes No

Cooler/Box Packing Material: Bubble Wrap Absorbent Foam Other:_____

Type of Ice: (Wet) Blue None **Ice Intact:** Yes (Melted)

Cooler Temperature: 2.7°C **Radiation Screened:** Yes (No) **Chain of Custody Present:** (Yes) No

Comments:_____

B. **Laboratory Assignment/Log-in** (check appropriate response)

	YES	NO	N/A	Comment Reference non-Conformance
Chain of Custody properly filled out	✓			
Chain of Custody relinquished	✓			
Sampler Name & Signature on COC	✓			
Containers intact	✓			
Were samples in separate bags	✓			
Sample container labels match COC Sample name/date and time collected	✓			
Sufficient volume provided	✓			
PAES containers used	✓			
Are containers properly preserved for the requested testing? (as labeled)			✓	
If an unknown preservation state, were containers checked? Exception: VOA's coliform			✓	If yes, see pH form.
Was volume for dissolved testing field filtered, as noted on the COC? Was volume received in a preserved container?			✓	
Headspace present?			✓	

Comments:_____

Cooler contents examined/received by : CY **Date:** 11.12.18

Project Manager Review : SRJ **Date:** 11-13-18.

APPENDIX F
LNAPL Baildown Field Forms

Well TW-18

Site Transco

Baildown/Slug Test Field Form

Project #:		**Site Name:**	Transco
Well:	TW-18	**Samplers:**	J. Terry, B. McGrann
Evacuation Method:	PP	**Weather:**	M. Cloudy, 58°F

Borehole Diameter (INCHES):
Filter Pack Specific Yield (LNAPL)
0.175

Well Information		**LNAPL Information**	
Casing Diameter (INCHES):	2	**Fluid Type:**	
Total Depth (FT):	22	**Volume Removed:**	6
Depth to Top of Screen (FT):	7	**Evacuation Method:**	PP
Screen Length (FT):	15	**LNAPL Well Volume:**	6.19 gal

Length and volumetric units need to be specified

Length Units: **Volume Units:**

Effective Well Radius (FT)
LNAPL Well Volume
ft^3
gal
ml

Period	Date	Time HH:MM	Elapsed Time (min)	DTP (feet)	DTW (feet)	Comments
Initial	11-7-18	0745	—	11.75	20.46	8.71 ft LNAPL
Removal Start	11-7-18	0800	—	11.75	20.46	Test Start 0920
Removal Stop	11-7-18	0919	—	13.65	13.70	LNAPL/Slug Volume Removed (gal): 6 Water Volume Removed (gal): negligible
Removal	"	0850	-	13.34	17.40	@0850: DTP: 13.34 3.5gal DTW: 17.40 purged
Removal	"	0915	-	13.65	14.18	@0915: DTP: 13.65 5.5gal DTW: 14.18 total
LNAPL Recharge	11-7-18	0921	1	13.42	13.44	LNAPL Thickness: 0.02 ft
"	"	0924	4	13.34	13.40	0.06'
"	"	0927	7	13.20	13.38	0.18'
"	"	0928	8	13.13	13.40	0.27'
"	"	0930	10	13.02	13.45	0.43'
"	"	0933	13	12.96	13.53	0.57'
"	"	0935	15	12.91	13.61	0.7'

Well TW-1B

Site Transco

Period	Date	Time HH:MM	Elapsed Time (min)	DTP (feet)	DTW (feet)	Comments
LNAPL Recharge	11-7-18	0941	21	12.83	13.68	LNAPL Thickness: 0.85'
"	"	0948	28	12.78	13.63	0.85'
"	"	0955	35	12.73	13.65	0.92'
"	"	1007	47	12.68	13.63	0.95'
"	"	1020	60	12.63	13.65	1.02'
"	"	1034	74	12.60	13.63	1.03'
"	"	1049	89	12.55	13.63	1.08'
"	"	1101	101	12.54	13.63	1.09'
"	"	1113	113	12.54	13.54	1'
"	"	1128	128	12.51	13.61	1.1'
"	"	1148	148	12.49	13.63	1.14'
"	"	1202	162	12.47	13.63	1.16'
"	"	1210	170	12.44	13.55	1.11'
"	"	1220	180	12.43	13.57	1.14'
"	"	1233	193	12.41	13.57	1.16'
"	"	1250	210	12.40	13.60	1.2
"	"	1350	270	12.36	13.69	1.33'

Well TW-1B

Site Transco

Period	Date	Time HH:MM	Elapsed Time (min)	DTP (feet)	DTW (feet)	Comments
LNAPL Recovery	11-7-18	1450	330	12.33	13.56	LNAPL Thickness: 1.23'
"	"	1513	353	12.31	13.56	1.25'
"	"	1533	373	12.30	13.62	1.32'
"	"	1540	380	12.30	13.62	1.32'
"	"	1550	390	12.31	13.67	1.36'
"	"	1600	400	12.30	13.72	1.42'
"	"	1615	415	12.30	13.72	1.42'
"	"	1630	430	12.30	13.72	1.42'
"	11-8-18	0735	1,335	12.31	14.38	2.07'

Well TW-24

Site TRANSCO

Baildown/Slug Test Field Form

Project #:		**Site Name:**	TRANSCO
Well:	TW-24	**Samplers:**	B. McGonn, J. Terry
Evacuation Method:	peristaltic	**Weather:**	Misty, 62° F

Borehole Diameter (INCHES):
Filter Pack Specific Yield (LNAPL)
0.175

Well Information		**LNAPL Information**	
Casing Diameter (INCHES):		**Fluid Type:**	
Total Depth (FT):		**Volume Removed:**	
Depth to Top of Screen (FT):		**Evacuation Method:**	peristaltic pump
Screen Length (FT):		**LNAPL Well Volume:**	

Length and volumetric units need to be specified

Length Units: **Volume Units:**

	Effective Well Radius (FT)
	LNAPL Well Volume
ft^3	
gal	
ml	

Period	Date	Time HH:MM	Elapsed Time (min)	DTP (feet)	DTW (feet)	Comments
Initial	11/8/18	0950	—	14.51	16.49	Collected 18312-TW-24 @ 0955
Removal Start		0953	—	14.51	16.49	Test Start
Removal Stop		1001	0	14.98	14.99	LNAPL/Slug Volume Removed (gal): 0.13 Water Volume Removed (gal): 0.21
Recharge		1004	3	14.86	14.88	LNAPL Thickness = 0.02
↓		1006	5	14.79	14.90	3/4" well LNAPL = 0.11
		1008	7	14.76	14.94	= 0.18
		1010	9	14.74	14.96	= 0.22
		1012	11	14.74	14.96	= 0.22
		1014	13	14.74	14.96	= 0.22
		1019	18	14.73	14.99	= 0.26
		1024	23	14.72	14.99	= 0.27
		1029	28	14.71	14.99	= 0.28

Well TW-24

Site TRANSCO

Period	Date	Time HH:MM	Elapsed Time (min)	DTP (feet)	DTW (feet)	Comments
Recharge	11/8/18	1034	33	14.70	14.99	LNAPL Thickness = 0.29
↓	↓	1041	40	14.70	14.99	= 0.29
		1051	50	14.69	14.99	= 0.30
		1101	60	14.69	15.02	= 0.33
		1111	70	14.69	15.02	= 0.33
		1131	90	14.69	15.03	= 0.34
		1245	164	14.67	15.02	= 0.35
		1345	224	14.63	15.02	1330 heavy rain started
		1510	309	14.62	15.04	
		1610	369	14.62	15.04	
		1630	389	14.62	15.04	Bottom = 22.12 ft.

Well EW-10

Site Transco

Baildown/Slug Test Field Form

Project #:		**Site Name:**	Transco
Well:	EW-10	**Samplers:**	J. Terry, B. McGuinn
Evacuation Method:	pp	**Weather:**	overcast, light rain, 64°F

Borehole Diameter (INCHES):
Filter Pack Specific Yield (LNAPL)
0.175

Well Information		**LNAPL Information**	
Casing Diameter (INCHES):	2	**Fluid Type:**	
Total Depth (FT):	27.49	**Volume Removed:**	
Depth to Top of Screen (FT):		**Evacuation Method:**	pp
Screen Length (FT):		**LNAPL Well Volume:**	~~2.74 gal~~ ~~1.8.4 gal~~ 1.85 gal

Length and volumetric units need to be specified

Length Units: **Volume Units:**

	Effective Well Radius (FT)
	LNAPL Well Volume
ft^3	
gal	
ml	

Period	Date	Time HH:MM	Elapsed Time (min)	DTP (feet)	DTW (feet)	Comments
Initial	11-8-18	0755	—	11.44	23.18	LNAPL Thickness: 11.74'
Removal Start	11-8-18	0832	—	11.44	23.18	Test Start 0920
Removal Stop	11-8-18	0920	—	13.89	13.90	LNAPL/Slug Volume Removed (gal): 4 Water Volume Removed (gal): negligible
LNAPL Recharge	11-8-18	0921	~~0~~ 1	—	13.70	LNAPL Thickness: 0'
"	"	0923	3	—	13.60	0'
"	"	0925	5	—	13.43	0'
"	"	0926	6	—	13.30	0'
"	"	0928	8	—	13.20	0'
"	"	0929	9	—	13.10	0'
"	"	0932	12	12.95	13.02	0.07'
"	"	0933	13	12.92	13.00	0.08'
"	"	0936	16	12.80	12.96	0.16'

C 0905
DTP: 13.30
DTW: 17.15
Purged: 2.5 gal

Note: There is an obstruction in EW-10 at ~18' BTOC

Well EW-10 Site Transco

Period	Date	Time HH:MM	Elapsed Time (min)	DTP (feet)	DTW (feet)	Comments
LNAPL Recharge	11-8-18	0939	19	12.71	12.96	LNAPL Thickness: 0.25'
"	"	0941	21	12.64	12.96	0.32'
"	"	0943	23	12.60	12.97	0.37'
"	"	0945	25	12.55	12.98	0.43'
"	"	0947	27	12.50	13.00	0.5'
"	"	0949	29	12.49	13.02	0.53'
"	"	0953	33	12.43	13.06	0.63'
"	"	0955	35	12.40	13.08	0.68'
"	"	1000	40	12.35	13.14	0.79'
"	"	1005	45	12.32	13.20	0.88'
"	"	1010	50	12.30	13.24	0.94'
"	"	1020	60	12.26	13.27	1.01'
"	"	1030	70	12.25	13.35	1.1'
"	"	1040	80	12.22	13.39	1.17'
"	"	1100	100	12.20	13.42	1.22'
"	"	1120	120	12.20	13.46	1.26'
"	"	1130	130	12.20	13.46	1.26'
"	"	1240	200	12.18	13.57	1.39'

Well EW-10

Site Transco

Period	Date	Time HH:MM	Elapsed Time (min)	DTP (feet)	DTW (feet)	Comments
LNAPL Recharge	11-8-18	1320	240	12.18	13.59	LNAPL Thickness: 1.41'
"	"	1400	280	12.15	13.60	1.45'
"	"	1420	300	12.16	13.61	1.45'
"	"	1450	330	12.15	13.61	1.46'
"	"	1520	360	12.15	13.62	1.47'
"	"	1554	394	12.14	13.62	1.48'
"	"	1640	440	12.14	13.66	1.52'

@ 1330 - heavy rain

@ 1455 - rain light

1505 - heavy rain

E2856 – 13

Well EW-13

Site TRANSCO

Baildown/Slug Test Field Form

Project #:	TRANSCO	**Site Name:**	TRANSCO
Well:	EW-13	**Samplers:**	B. McGann, J. Terry
Evacuation Method:	peristaltic	**Weather:**	Cloudy 59°F

Borehole Diameter (INCHES):
Filter Pack Specific Yield (LNAPL)
0.175

Well Information		**LNAPL Information**	
Casing Diameter (INCHES):		**Fluid Type:**	
Total Depth (FT):		**Volume Removed:**	
Depth to Top of Screen (FT):		**Evacuation Method:**	peristaltic pump
Screen Length (FT):		**LNAPL Well Volume:**	

Effective Well Radius (FT)

	LNAPL Well Volume
ft^3	
gal	
ml	

Length and volumetric units need to be specified
Length Units: **Volume Units:**

Period	Date	Time HH:MM	Elapsed Time (min)	DTP (feet)	DTW (feet)	Comments
Initial	11/8/18	0755	—	10.90	13.71	Measured from TOP of floor initial LNAPL thickness = 2.81
Removal Start	" "	0756	—	10.90	13.71	Collected 18312-EW-13 @ 0810 Test Start
Removal Stop	" "	0832	0	11.86	11.87	LNAPL/Slug Volume Removed (gal): 1.41 Water Volume Removed (gal): 0.09
Recharge	" "	0834	2	11.80	11.84	LNAPL THICKNESS = 0.04
" "	" "	0836	4	11.70	11.81	0.11
" "	" "	0838	6	11.66	11.79	0.13
" "	" "	0840	8	11.61	11.76	0.15
" "	" "	0842	10	11.57	11.74	0.17
" "	" "	0844	12	11.55	11.72	0.17
" "	" "	0846	14	11.51	11.69	0.18
" "	" "	0848	16	11.48	11.67	0.19
" "	" "	0850	18	11.47	11.66	0.19

Well EW-13

Site TRANSCO

Period	Date	Time HH:MM	Elapsed Time (min)	DTP (feet)	DTW (feet)	Comments
Recharge	11/8/18	0852	20	11.45	11.64	LNAPL thickness = 0.19
"	"	0857	25	11.42	11.62	0.20
"	"	0902	30	11.40	11.60	0.20
"	"	0912	40	11.37	11.59	0.22
"	"	0922	50	11.35	11.58	0.23
"	"	0932	60	11.32	11.58	0.26
"	"	0942	70	11.33	11.58	0.25
"	"	0950	78	11.32	11.58	0.26
"	"	1010	98	11.30	11.58	0.28
"	"	1030	118	11.30	11.58	0.28
"	"	1100	148	11.28	11.58	0.30
"	"	1130	178	11.27	11.58	0.31
"	"	1245	253	11.24	11.58	0.34
"	"	1325	293	11.22	11.56	0.34 Heavy rain started @ 1330
"	"	1400	328	11.20	11.55	0.35
"	"	1420	348	11.20	11.55	0.35
"	"	1450	378	11.20	11.55	0.35 light rain @ 1455
"	"	1520	408	11.19	11.55	0.36 1505 - heavy rain

Well EW-13

Site Transco

Period	Date	Time HH:MM	Elapsed Time (min)	DTP (feet)	DTW (feet)	Comments
LNAPL Recharge	11-8-18	1555	443	11.18	11.55	0.37
		1650	498	11.18	11.55	
						Bottom = 24.92

Well TW-20

Site Transco

Baildown/Slug Test Field Form

Project #:		**Site Name:**	Transco
Well:	TW-20	**Samplers:**	J. Terry, B. McGuire
Evacuation Method:	PP	**Weather:**	P. cloudy, 77F

Borehole Diameter (INCHES):
Filter Pack Specific Yield (LNAPL)
0.175

Well Information		**LNAPL Information**	
Casing Diameter (INCHES):	2	**Fluid Type:**	LNAPL
Total Depth (FT):	22	**Volume Removed:**	
Depth to Top of Screen (FT):	7	**Evacuation Method:**	peristaltic pump
Screen Length (FT):	15	**LNAPL Well Volume:**	0.69 gal

Length and volumetric units need to be specified

Length Units: **Volume Units:**

Effective Well Radius (FT)	
LNAPL Well Volume	
ft^3	
gal	
ml	

Period	Date	Time HH:MM	Elapsed Time (min)	DTP (feet)	DTW (feet)	Comments
Initial	11-6-18	1445	—	12.36	13.33	
Removal Start	11-6-18	1507				Test Start
Removal Stop	11-6-18	1634	87	13.53	13.61	LNAPL/Slug Volume Removed (gal): 0.23 Water Volume Removed (gal): 0.07
						There is ~0.05' of
						LNAPL recharge every
						10 minutes

Well EW-12

Site Transco

Baildown/Slug Test Field Form

Project #:		**Site Name:**	TRANSCO
Well:	EW-12	**Samplers:**	B. McGann, J. Terry
Evacuation Method:	peristaltic	**Weather:**	Sunny 77°F

Well Information		**LNAPL Information**	
Casing Diameter (INCHES):	2	**Fluid Type:**	
Total Depth (FT):	22	**Volume Removed:**	1.1 gal
Depth to Top of Screen (FT):	7	**Evacuation Method:**	PP
Screen Length (FT):	15	**LNAPL Well Volume:**	0.83 gal

Length and volumetric units need to be specified

Length Units: **Volume Units:**

Borehole Diameter (INCHES):
Filter Pack Specific Yield (LNAPL)
0.175

Effective Well Radius (FT)	
	LNAPL Well Volume
ft^3	
gal	
ml	

Period	Date	Time HH:MM	Elapsed Time (min)	DTP (feet)	DTW (feet)	Comments
Initial	11/6/18	1535	—	11.31	13.41	measured from floor
Removal Start	11/6/18	1540	—			Test Start
Removal Stop	11/6/18	1612	—	12.45	12.50	LNAPL/Slug Volume Removed (gal): 1.10 Water Volume Removed (gal): 0.05
	" "	1619	7	12.19	12.20	
	" "	1628	16	11.96	12.10	
	" "	1632	20	11.86	12.01	
	" "	1642	30	11.78	11.96	
	" "	1652	40	11.71	11.91	
	" "	1712	60	11.66	11.96	
	" "	1722	70	11.65	11.91	
	" "	1732	80	11.64	11.91	
	" "	1742	90	11.64	11.91	
		1752	100	11.64	11.91	

Well TW-19

Site TRANSCO

Baildown/Slug Test Field Form

Project #:		**Site Name:**	TRANSCO
Well:	TW-19	**Samplers:**	B. McGann, T. Terry
Evacuation Method:	peristaltic	**Weather:**	Cloudy 59 °F

Well Information		**LNAPL Information**	
Casing Diameter (INCHES):	2	**Fluid Type:**	
Total Depth (FT):	22	**Volume Removed:**	1.59 gal
Depth to Top of Screen (FT):	7	**Evacuation Method:**	PP
Screen Length (FT):	15	**LNAPL Well Volume:**	3.17 gal

Length and volumetric units need to be specified

Length Units: **Volume Units:**

Borehole Diameter (INCHES):
Filter Pack Specific Yield (LNAPL)
0.175

Effective Well Radius (FT)
LNAPL Well Volume

ft^3	
gal	
ml	

Period	Date	Time HH:MM	Elapsed Time (min)	DTP (feet)	DTW (feet)	Comments
Initial	11/7/18	0750	—	12.14	16.54	collected 18311-TW-19 @0815
Removal Start	"	0800	—	12.18	16.70	Test Start
Removal Stop	"	0823	—	13.01	13.03	LNAPL/Slug Volume Removed (gal): 1.59 purged until only water evacuated Water Volume Removed (gal): 0.13
	"	0825	2	12.96	13.00	LNAPL = 0.04
	"	0827	4	12.89	13.00	LNAPL=0.11
	"	0829	6	12.83	13.04	LNAPL=0.21
	"	0831	8	12.80	13.11	LNAPL 0.31
	"	0833	10	12.76	13.18	LNAPL =0.42
	"	0835	12	12.72	13.26	LNAPL =0.54
	"	0837	14	12.71	13.33	LNAPL = 0.62
	"	0839	16	12.68	13.37	LNAPL =0.69
	"	0841	18	12.66	13.41	LNAPL =0.75

Well TW-19 Site

Period	Date	Time HH:MM	Elapsed Time (min)	DTP (feet)	DTW (feet)	Comments
	11/7/18	0843	20	12.66	13.45	LNAPL 0.79
	11/7/18	0848	25	12.61	13.57	LNAPL 0.96
	11/7/18	0850	27	12.61	13.59	0.98
	11/7/18	0855	32	12.59	13.66	1.07
	11/7/18	0900	37	12.58	13.74	1.16
	11/7/18	0905	42	12.56	13.76	1.2
	11/7/18	0910	47	12.56	13.80	1.24
	11/7/18	0915	52	12.54	13.83	1.29
	11/7/18	0925	62	12.54	13.89	1.35
	11/7/18	0935	72	12.53	13.89	1.36
	11/7/18	0955	92	12.52	13.91	1.39
	11/7/18	1025	122	12.51	13.94	1.43
	11/7/18	1055	152	12.51	13.95	1.44
	11/7/18	1125	182	12.49	13.96	1.47
	11/7/18	1225	242	12.45	13.96	1.51
	11/7/18	1435	372	12.44	13.96	1.52

APPENDIX G
API Transmissivity Workbook Output

Well Designation:	EW-10	Beckett and Lyverse (2002)
Date:	17-Dec-18	

Ground Surface Elev (ft msl)	0.0	Enter These Data
Top of Casing Elev (ft msl)	0.0	
Well Casing Radius, r_c (ft):	0.083	r_{e1}
Well Radius, r_w (ft):	0.180	
LNAPL Specific Yield, S_y:	0.175	
LNAPL Density Ratio, ρ_r:	0.780	
Top of Screen (ft bgs):	5.0	
Bottom of Screen (ft bgs):	25.0	
LNAPL Baildown Vol. (gal.):	4.0	
Effective Radius, r_{e3} (ft):	0.107	Calculated Parameters
Effective Radius, r_{e2} (ft):	0.098	
Initial Casing LNAPL Vol. (gal.):	1.90	
Initial Filter LNAPL Vol. (gal.):	1.23	

Drawdown Adjustment (ft)
0.66

Enter Data Here

	Time (min)	DTP (ft btoc)	DTW (ft btoc)	DTP (ft bgs)	DTW (ft bgs)	Water Table Depth (ft)	LNAPL Drawdown s_n (ft)	LNAPL Average Time (min)	LNAPL Discharge Q_n (ft^3/d)	s_n (ft)	b_n (ft)	r_e (ft)
Initial Fluid Levels:	0	11.44	23.18	11.44	23.18	14.02					11.74	
Enter Test Data:	1.0	13.70	13.70	13.70	13.70	13.70	1.60				0.00	
	3.0	13.60	13.60	13.60	13.60	13.60	1.50	2.0	0.000	1.55	0.00	0.107
	5.0	13.43	13.43	13.43	13.43	13.43	1.33	4.0	0.000	1.42	0.00	0.107
	6.0	13.30	13.30	13.30	13.30	13.30	1.20	5.5	0.000	1.27	0.00	0.107
	8.0	13.20	13.20	13.20	13.20	13.20	1.10	7.0	0.000	1.15	0.00	0.107
	9.0	13.10	13.10	13.10	13.10	13.10	1.00	8.5	0.000	1.05	0.00	0.107
	12.0	12.95	13.02	12.95	13.02	12.97	0.85	10.5	1.198	0.93	0.07	0.107
	13.0	12.92	13.00	12.92	13.00	12.94	0.82	12.5	0.514	0.84	0.08	0.107
	16.0	12.80	12.90	12.80	12.90	12.82	0.70	14.5	0.342	0.76	0.10	0.107
	19.0	12.71	12.96	12.71	12.96	12.77	0.61	17.5	2.568	0.66	0.25	0.107
	21.0	12.64	12.96	12.64	12.96	12.71	0.54	20.0	1.798	0.58	0.32	0.107
	23.0	12.60	12.97	12.60	12.97	12.68	0.50	22.0	1.284	0.52	0.37	0.107
	25.0	12.55	12.98	12.55	12.98	12.64	0.45	24.0	1.541	0.48	0.43	0.107
	27.0	12.5	13.00	12.50	13.00	12.61	0.40	26.0	1.798	0.43	0.50	0.107
	29.0	12.49	13.02	12.49	13.02	12.61	0.39	28.0	0.770	0.40	0.53	0.107
	33.0	12.43	13.06	12.43	13.06	12.57	0.33	31.0	1.284	0.36	0.63	0.107
	35.0	12.4	13.08	12.40	13.08	12.55	0.30	34.0	1.284	0.32	0.68	0.107
	40.0	12.35	13.14	12.35	13.14	12.52	0.25	37.5	1.130	0.28	0.79	0.107
	45.0	12.32	13.20	12.32	13.20	12.51	0.22	42.5	0.925	0.24	0.88	0.107
	50.0	12.3	13.24	12.30	13.24	12.51	0.20	47.5	0.616	0.21	0.94	0.107
	60.0	12.26	13.27	12.26	13.27	12.48	0.16	55.0	0.360	0.18	1.01	0.107
	70.0	12.25	13.35	12.25	13.35	12.49	0.15	65.0	0.462	0.16	1.10	0.107
	80.0	12.22	13.39	12.22	13.39	12.48	0.12	75.0	0.360	0.14	1.17	0.107
	100.00	12.2	13.42	12.20	13.42	12.47	0.10	90.0	0.128	0.11	1.22	0.107
	120.00	12.2	13.46	12.20	13.46	12.48	0.10	110.0	0.103	0.10	1.26	0.107
	130.00	12.2	13.46	12.20	13.46	12.48	0.10	125.0	0.000	0.10	1.26	0.107
	200.00	12.18	13.57	12.18	13.57	12.49	0.08	165.0	0.095	0.09	1.39	0.107
	240.00	12.18	13.59	12.18	13.59	12.49	0.08	220.0	0.026	0.08	1.41	0.107
	280.00	12.15	13.60	12.15	13.60	12.47	0.05	260.0	0.051	0.07	1.45	0.107
	300.00	12.16	13.61	12.16	13.61	12.48	0.06	290.0	0.000	0.06	1.45	0.107
	330.00	12.15	13.61	12.15	13.61	12.47	0.05	315.0	0.017	0.06	1.46	0.107
	360.00	12.15	13.62	12.15	13.62	12.47	0.05	345.0	0.017	0.05	1.47	0.107
	394.00	12.14	13.62	12.14	13.62	12.47	0.04	377.0	0.015	0.05	1.48	0.107
	440.00	12.14	13.66	12.14	13.66	12.47	0.04	417.0	0.045	0.04	1.52	0.107

Figure 1

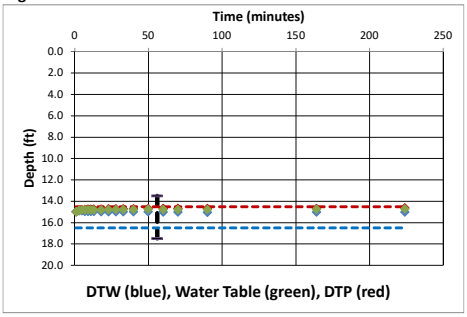
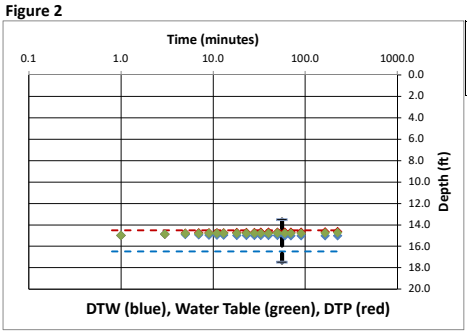


Figure 2



0.8	14.51
224	14.51
0.8	16.49
224	16.49

56.0	13.51	13.5
56.0	17.5	17.5

Figure 3

Q_n (ft^3/d)	s_n (ft)
0	0
0.2	0.15

Drawdown Adjust.	
Δs_n (ft)	0.11

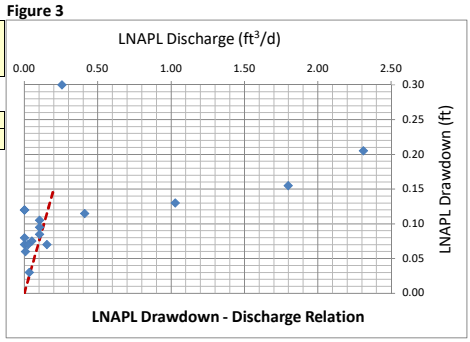
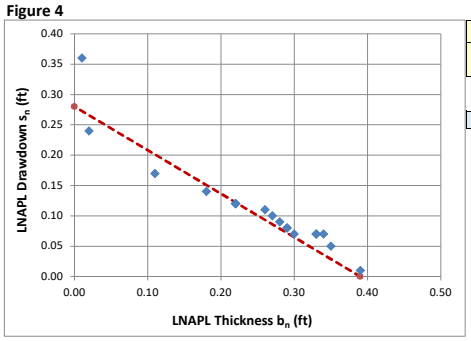


Figure 4



b_n	s_n
0.39	0
0	0.28

J-ratio	-0.718

Figure 5

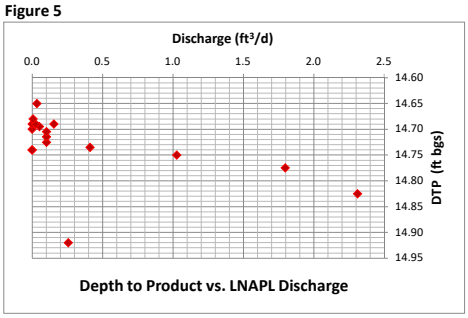


Figure 6

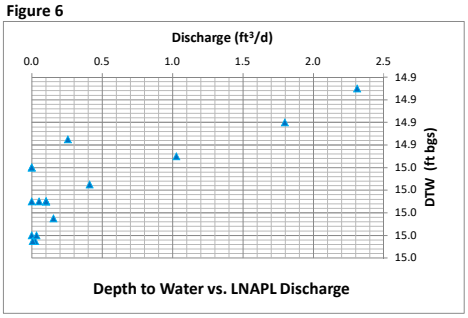


Figure 7

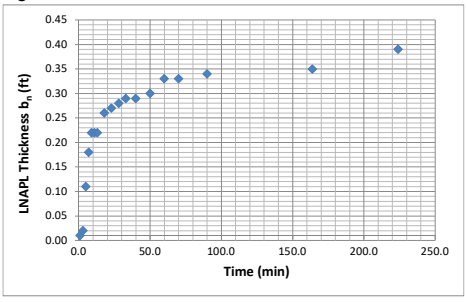


Figure 8

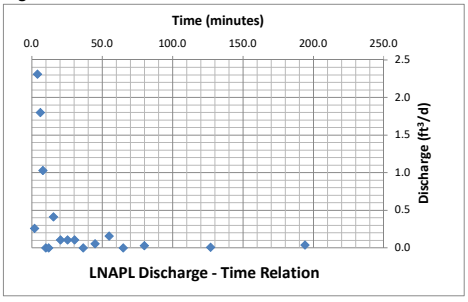


Figure 9

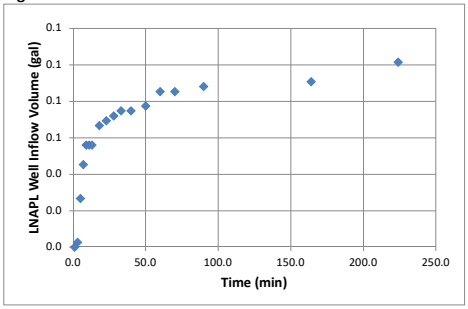
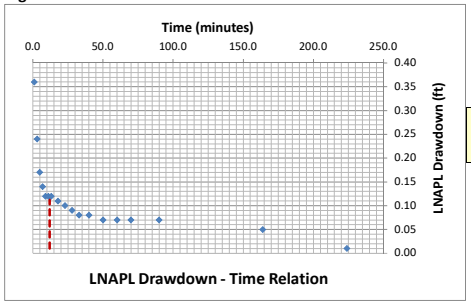


Figure 10



t (min)	s_n (ft)
12	0.115
12	0

Generalized Bouwer and Rice (1976)

Well Designation:	TW-24
Date:	15-Dec-18

$$T_n = \frac{r_e^{\,2}\,\ln(R/r_e)\ln(s_n(t_1)/s_n(t))}{2(-J)(t-t_1)}$$

Enter early time cut-off for least-squares model fit

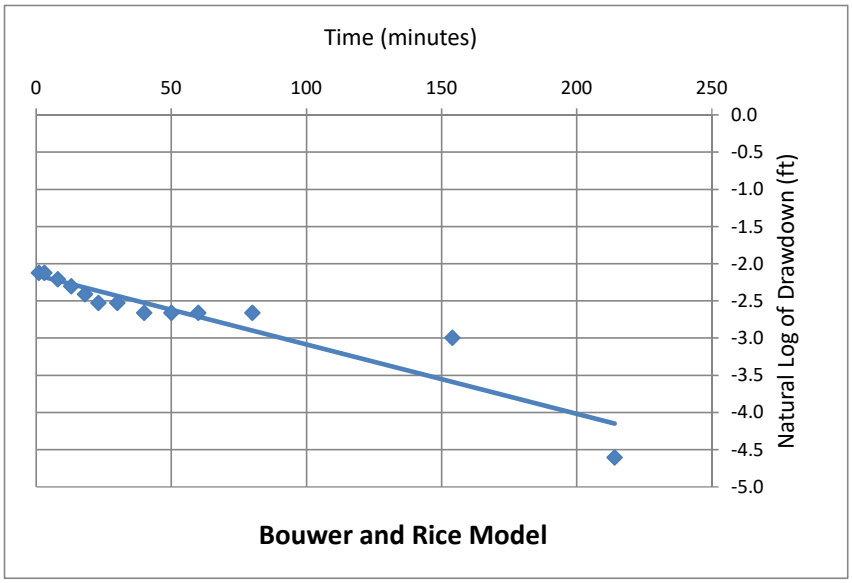
$Time_{cut}$	10	<- Enter or change value here

Model Results: T_n (ft^2/d) = 0.23 +/- 0.03 ft^2/d

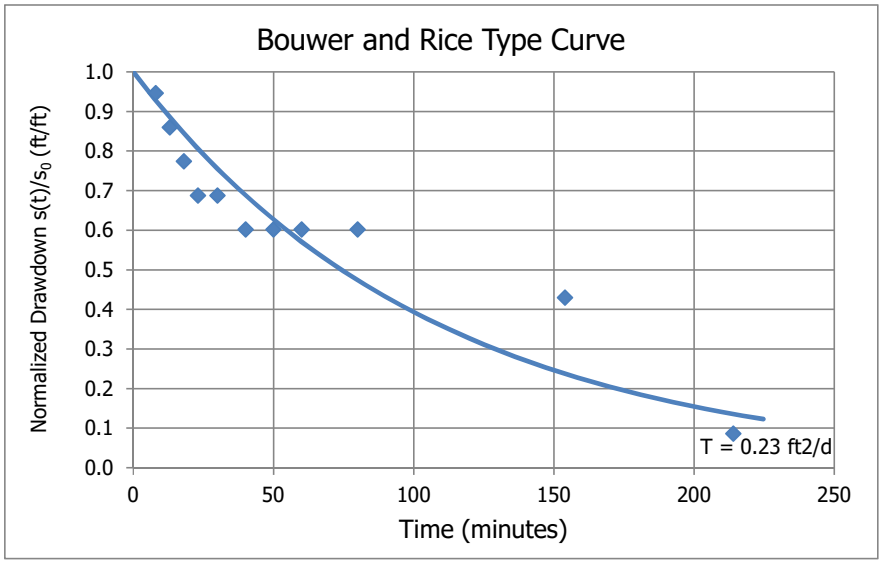
L_e/r_e
18.6
C
1.53
R/r_e
8.83

J-Ratio
-0.718

Coef. Of Variation
0.12



C coefficient calculated from Eq. 6.5(c) of Butler, The Design, Performance, and Analysis of Slug Tests, CRC Press, 2000.



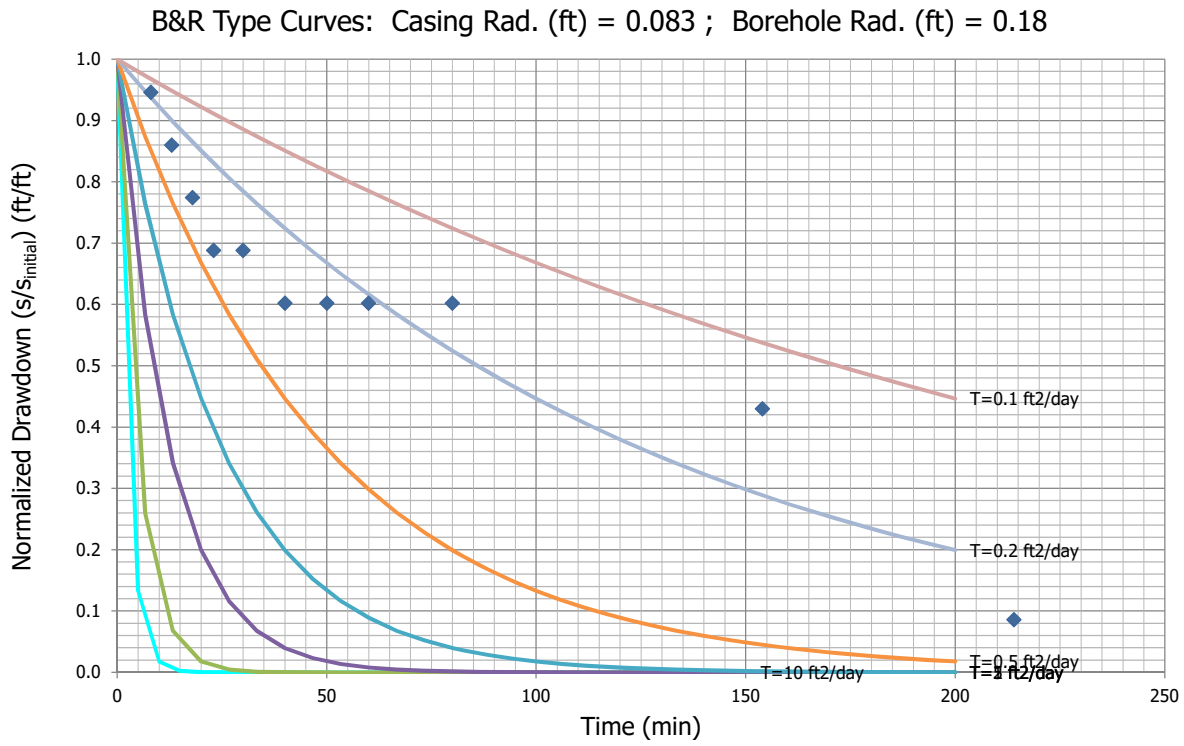
Bouwer and Rice Short Term LNAPL Mobility Test Type Curves

B&R Type Curves: Casing Rad. (ft) = 0.083 ; Borehole Rad. (ft) = 0.18

Enter these values

Type Curve ID	Type Curve Name	Notes	Max Time (min)	Transmissivity (ft^2/day)
1	T=10 ft2/day		150	10
2	T=5 ft2/day		200	5
3	T=2 ft2/day		200	2
4	T=1 ft2/day		200	1
5	T=0.5 ft2/day		200	0.5
6	T=0.2 ft2/day		200	0.2
7	T=0.1 ft2/day		200	0.1

J-Ratio	
-0.718	<-- If uncertain us
	-0.22



Well Designation:	EW-13	Beckett and Lyverse (2002)
Date:	15-Dec-18	

Ground Surface Elev (ft msl)	0.0	Enter These Data
Top of Casing Elev (ft msl)	0.0	
Well Casing Radius, r_c (ft):	0.083	r_{e1}
Well Radius, r_w (ft):	0.180	
LNAPL Specific Yield, S_y:	0.175	
LNAPL Density Ratio, ρ_r:	0.780	
Top of Screen (ft bgs):	5.0	
Bottom of Screen (ft bgs):	25.0	
LNAPL Baildown Vol. (gal.):	4.0	
Effective Radius, r_{e3} (ft):	0.107	Calculated Parameters
Effective Radius, r_{e2} (ft):	0.077	
Initial Casing LNAPL Vol. (gal.):	0.45	
Initial Filter LNAPL Vol. (gal.):	0.29	

Drawdown Adjustment (ft)
0.26

Enter Data Here

	Time (min)	DTP (ft btoc)	DTW (ft btoc)	DTP (ft bgs)	DTW (ft bgs)	Water Table Depth (ft)	LNAPL Drawdown s_n (ft)	Average Time (min)	LNAPL Discharge Q_n (ft^3/d)	s_n (ft)	b_n (ft)	r_e (ft)
Initial Fluid Levels:	0	10.90	13.71	10.90	13.71	11.52					2.81	
Enter Test Data:	1.0	11.86	11.87	11.86	11.87	11.86	0.70				0.01	
	2.0	11.80	11.84	11.80	11.84	11.81	0.64	1.5	1.541	0.67	0.04	0.107
	4.0	11.70	11.81	11.70	11.81	11.72	0.54	3.0	1.798	0.59	0.11	0.107
	6.0	11.66	11.79	11.66	11.79	11.69	0.50	5.0	0.514	0.52	0.13	0.107
	8.0	11.61	11.76	11.61	11.76	11.64	0.45	7.0	0.514	0.47	0.15	0.107
	10.0	11.57	11.74	11.57	11.74	11.61	0.41	9.0	0.514	0.43	0.17	0.107
	12.0	11.55	11.72	11.55	11.72	11.59	0.39	11.0	0.000	0.40	0.17	0.107
	14.0	11.51	11.69	11.51	11.69	11.55	0.35	13.0	0.257	0.37	0.18	0.107
	16.0	11.48	11.67	11.48	11.67	11.52	0.32	15.0	0.257	0.34	0.19	0.107
	18.0	11.47	11.66	11.47	11.66	11.51	0.31	17.0	0.000	0.32	0.19	0.107
	20.0	11.45	11.64	11.45	11.64	11.49	0.29	19.0	0.000	0.30	0.19	0.107
	25.0	11.42	11.62	11.42	11.62	11.46	0.26	22.5	0.103	0.27	0.20	0.107
	30.0	11.4	11.60	11.40	11.60	11.44	0.24	27.5	0.000	0.25	0.20	0.107
	40.0	11.37	11.59	11.37	11.59	11.42	0.21	35.0	0.103	0.22	0.22	0.107
	50.0	11.35	11.58	11.35	11.58	11.40	0.19	45.0	0.051	0.20	0.23	0.107
	60.0	11.32	11.58	11.32	11.58	11.38	0.16	55.0	0.154	0.18	0.26	0.107
	70.0	11.33	11.58	11.33	11.58	11.39	0.17	65.0	-0.051	0.17	0.25	0.107
	78.0	11.32	11.58	11.32	11.58	11.38	0.16	74.0	0.064	0.17	0.26	0.107
	98.0	11.3	11.58	11.30	11.58	11.36	0.14	88.0	0.051	0.15	0.28	0.107
	118.0	11.3	11.58	11.30	11.58	11.36	0.14	108.0	0.000	0.14	0.28	0.107
	148.0	11.28	11.58	11.28	11.58	11.35	0.12	133.0	0.034	0.13	0.30	0.107
	178.0	11.27	11.58	11.27	11.58	11.34	0.11	163.0	0.017	0.11	0.31	0.107
	253.0	11.24	11.58	11.24	11.58	11.31	0.08	215.5	0.021	0.09	0.34	0.107
	293.00	11.22	11.56	11.22	11.56	11.29	0.06	273.0	0.000	0.07	0.34	0.107
	328.00	11.2	11.55	11.20	11.55	11.28	0.04	310.5	0.015	0.05	0.35	0.107
	348.00	11.2	11.55	11.20	11.55	11.28	0.04	338.0	0.000	0.04	0.35	0.107
	378.00	11.2	11.55	11.20	11.55	11.28	0.04	363.0	0.000	0.04	0.35	0.107
	408.00	11.19	11.55	11.19	11.55	11.27	0.03	393.0	0.017	0.03	0.36	0.107
	443.00	11.18	11.55	11.18	11.55	11.26	0.02	425.5	0.015	0.02	0.37	0.107
	498.00	11.18	11.55	11.18	11.55	11.26	0.02	470.5	0.000	0.02	0.37	0.107

Figure 1

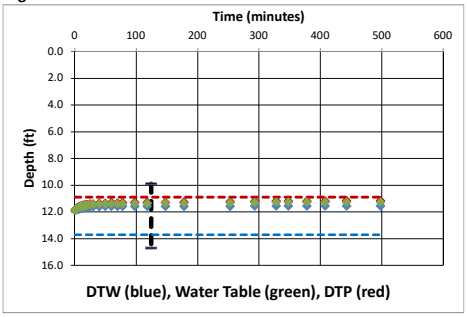
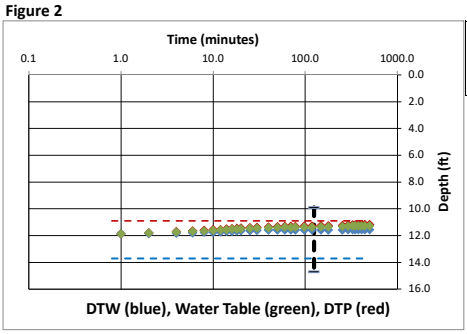


Figure 2



0.8	10.90
498	10.90
0.8	13.71
498	13.71

124.5	9.9	9.9
124.5	14.7	14.7

Figure 3

Q_n (ft^3/d)	s_n (ft)
0	0
0.4	1

Drawdown Adjust.	
Δs_n (ft)	0.26

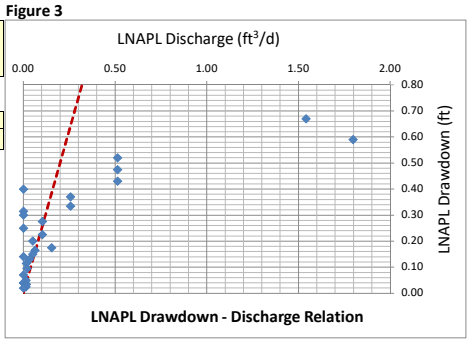
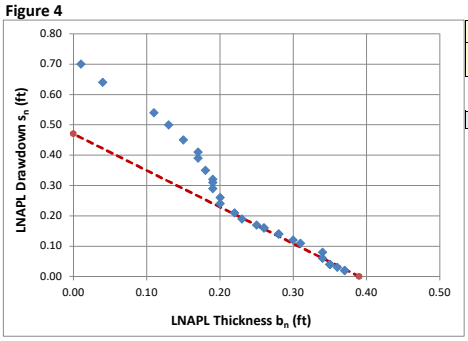


Figure 4



b_n	s_n
0.39	0
0	0.47

J-ratio	-1.205

Figure 5

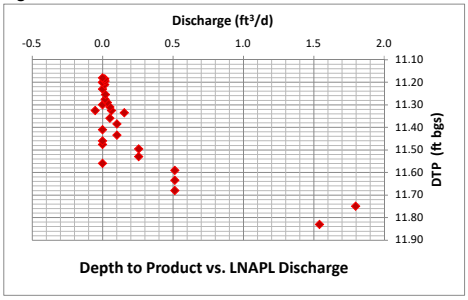


Figure 6

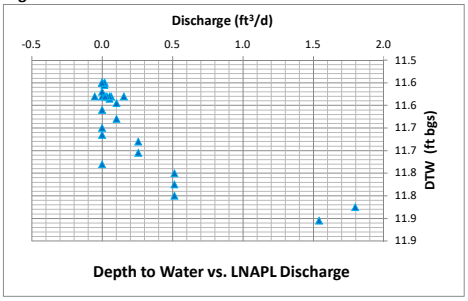


Figure 7

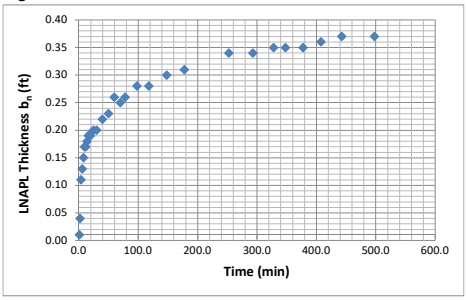


Figure 8

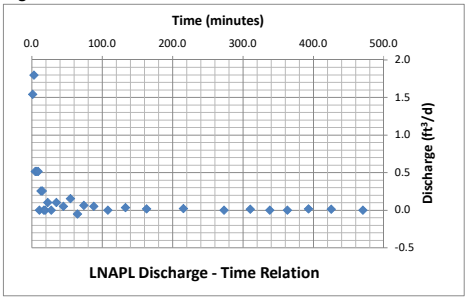


Figure 9

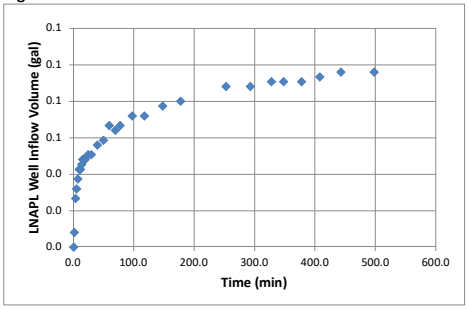
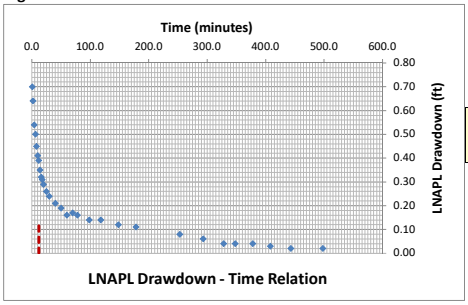


Figure 10



t (min)	s_n (ft)
12	0.115
12	0

Generalized Bouwer and Rice (1976)

Well Designation:	EW-13
Date:	15-Dec-18

$$T_n = \frac{r_e^{\,2} \ln(R/r_e) \ln(s_n(t_1)/s_n(t))}{2(-J)(t - t_1)}$$

Enter early time cut-off for least-squares model fit

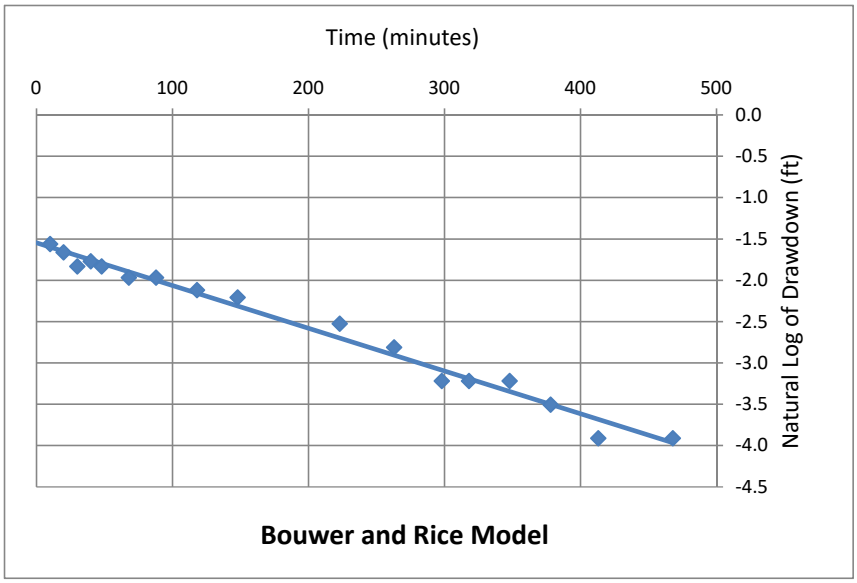
$Time_{cut}$	30	<- Enter or change value here

Model Results: T_n (ft^2/d) = 0.09 +/- 0.00 ft^2/d

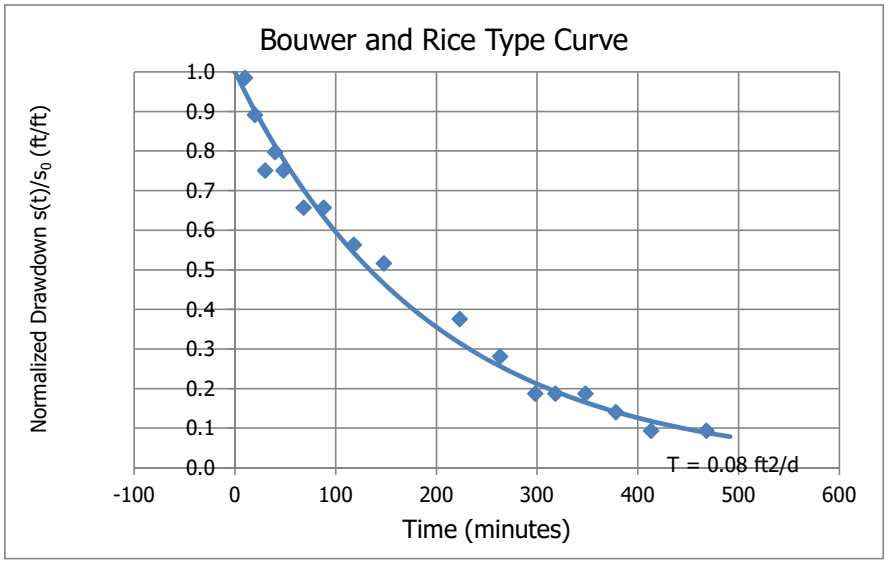
L_e/r_e
26.4
C
1.85
R/r_e
11.73

J-Ratio
-1.205

Coef. Of Variation
0.03



C coefficient calculated from Eq. 6.5(c) of Butler, The Design, Performance, and Analysis of Slug Tests, CRC Press, 2000.



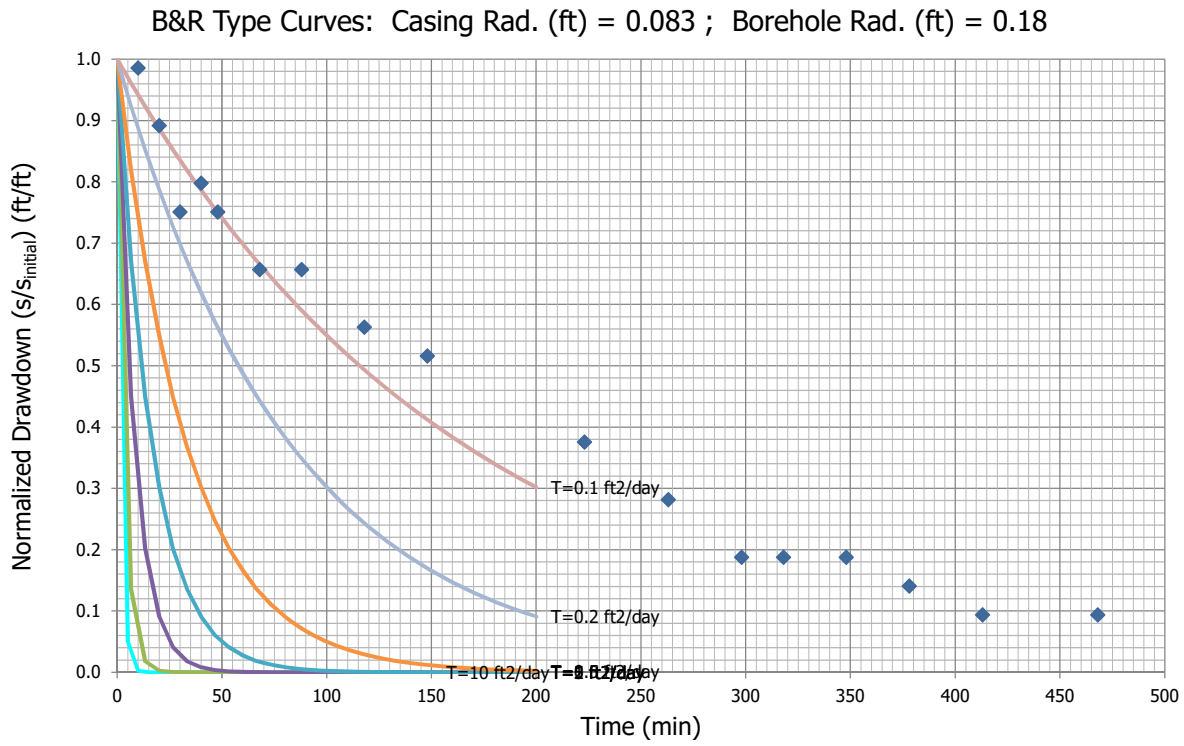
Bouwer and Rice Short Term LNAPL Mobility Test Type Curves

B&R Type Curves: Casing Rad. (ft) = 0.083 ; Borehole Rad. (ft) = 0.18

Enter these values

Type Curve ID	Type Curve Name	Notes	Max Time (min)	Transmissivity (ft^2/day)
1	T=10 ft2/day		150	10
2	T=5 ft2/day		200	5
3	T=2 ft2/day		200	2
4	T=1 ft2/day		200	1
5	T=0.5 ft2/day		200	0.5
6	T=0.2 ft2/day		200	0.2
7	T=0.1 ft2/day		200	0.1

J-Ratio	
-1.205	<-- If uncertain us
	-0.22



Well Designation:	TW-18	Beckett and Lyverse (2002)
Date:	15-Dec-18	

Ground Surface Elev (ft msl)	0.0	Enter These Data
Top of Casing Elev (ft msl)	0.0	
Well Casing Radius, r_c (ft):	0.083	r_{e1}
Well Radius, r_w (ft):	0.180	
LNAPL Specific Yield, S_y:	0.175	
LNAPL Density Ratio, ρ_r:	0.780	
Top of Screen (ft bgs):	7.0	
Bottom of Screen (ft bgs):	22.0	
LNAPL Baildown Vol. (gal.):	1.6	
Effective Radius, r_{e3} (ft):	0.107	Calculated Parameters
Effective Radius, r_{e2} (ft):	0.085	
Initial Casing LNAPL Vol. (gal.):	1.41	
Initial Filter LNAPL Vol. (gal.):	0.91	

Drawdown Adjustment (ft)
0.5

Enter Data Here

	Time (min)	DTP (ft btoc)	DTW (ft btoc)	DTP (ft bgs)	DTW (ft bgs)	Water Table Depth (ft)	LNAPL Drawdown s_n (ft)	Average Time (min)	LNAPL Discharge Q_n (ft^3/d)	s_n (ft)	b_n (ft)	r_e (ft)
Initial Fluid Levels:	0	11.75	20.46	11.75	20.46	13.67					8.71	
Enter Test Data:	1.0	13.42	13.44	13.42	13.44	13.42	1.17				0.02	
	3.0	13.34	13.40	13.34	13.40	13.35	1.09	2.0	1.027	1.13	0.06	0.107
	6.0	13.20	13.38	13.20	13.38	13.24	0.95	4.5	2.054	1.02	0.18	0.107
	7.0	13.13	13.40	13.13	13.40	13.19	0.88	6.5	4.623	0.92	0.27	0.107
	9.0	13.02	13.45	13.02	13.45	13.11	0.77	8.0	4.109	0.83	0.43	0.107
	12.0	12.96	13.53	12.96	13.53	13.09	0.71	10.5	2.397	0.74	0.57	0.107
	14.0	12.91	13.61	12.91	13.61	13.06	0.66	13.0	3.339	0.69	0.70	0.107
	20.0	12.83	13.68	12.83	13.68	13.02	0.58	17.0	1.284	0.62	0.85	0.107
	27.0	12.78	13.63	12.78	13.63	12.97	0.53	23.5	0.000	0.56	0.85	0.107
	34.0	12.73	13.65	12.73	13.65	12.93	0.48	30.5	0.514	0.51	0.92	0.107
	46.0	12.68	13.63	12.68	13.63	12.89	0.43	40.0	0.128	0.46	0.95	0.107
	59.0	12.63	13.65	12.63	13.65	12.85	0.38	52.5	0.277	0.41	1.02	0.107
	73.0	12.6	13.63	12.60	13.63	12.83	0.35	66.0	0.037	0.37	1.03	0.107
	88.0	12.55	13.63	12.55	13.63	12.79	0.30	80.5	0.171	0.33	1.08	0.107
	100.0	12.54	13.63	12.54	13.63	12.78	0.29	94.0	0.043	0.30	1.09	0.107
	112.0	12.54	13.54	12.54	13.54	12.76	0.29	106.0	-0.385	0.29	1.00	0.107
	127.0	12.51	13.61	12.51	13.61	12.75	0.26	119.5	0.342	0.27	1.10	0.107
	147.0	12.49	13.63	12.49	13.63	12.74	0.24	137.0	0.103	0.25	1.14	0.107
	161.0	12.47	13.63	12.47	13.63	12.73	0.22	154.0	0.073	0.23	1.16	0.107
	169.0	12.44	13.55	12.44	13.55	12.68	0.19	165.0	-0.321	0.21	1.11	0.107
	179.0	12.43	13.57	12.43	13.57	12.68	0.18	174.0	0.154	0.19	1.14	0.107
	192.0	12.41	13.57	12.41	13.57	12.67	0.16	185.5	0.079	0.17	1.16	0.107
	209.0	12.4	13.60	12.40	13.60	12.66	0.15	200.5	0.121	0.16	1.20	0.107
	269.00	12.36	13.69	12.36	13.69	12.65	0.11	239.0	0.111	0.13	1.33	0.107
	329.00	12.33	13.56	12.33	13.56	12.60	0.08	299.0	-0.086	0.09	1.23	0.107
	352.00	12.31	13.56	12.31	13.56	12.59	0.06	340.5	0.045	0.07	1.25	0.107
	372.00	12.3	13.62	12.30	13.62	12.59	0.05	362.0	0.180	0.06	1.32	0.107
	379.00	12.3	13.62	12.30	13.62	12.59	0.05	375.5	0.000	0.05	1.32	0.107
	389.00	12.31	13.67	12.31	13.67	12.61	0.06	384.0	0.205	0.06	1.36	0.107
	399.00	12.3	13.72	12.30	13.72	12.61	0.05	394.0	0.308	0.06	1.42	0.107
	414.00	12.3	13.72	12.30	13.72	12.61	0.05	406.5	0.000	0.05	1.42	0.107
	429.00	12.3	13.72	12.30	13.72	12.61	0.05	421.5	0.000	0.05	1.42	0.107

Figure 1

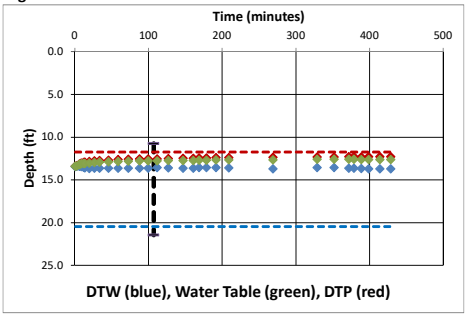
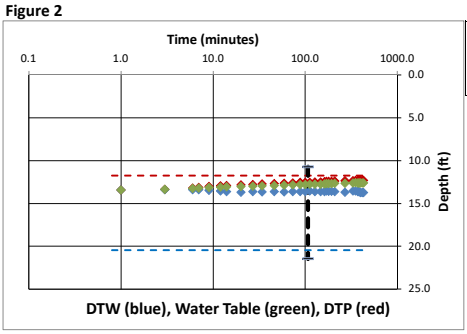


Figure 2



0.8	11.75
429	11.75
0.8	20.46
429	20.46

107.3	10.75	10.8
107.3	21.5	21.5

Figure 3

Q_n (ft^3/d)	s_n (ft)
0	0
0.5	1.4

Drawdown Adjust.	
Δs_n (ft)	0.5

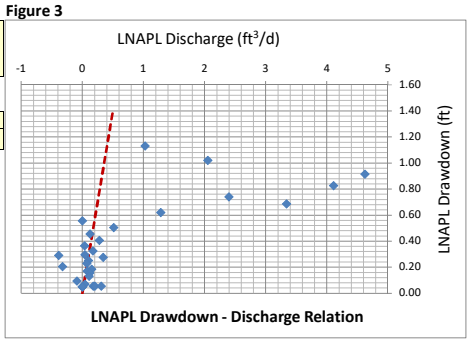


Figure 4

b_n	s_n
1.4	0
0	1.3

J-ratio	-0.929

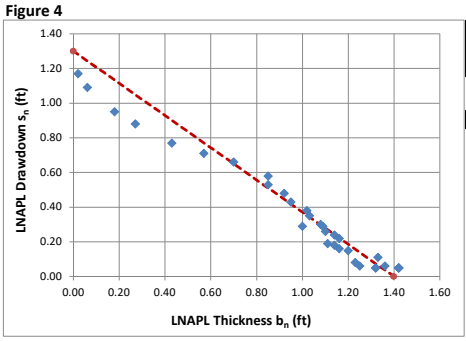


Figure 5

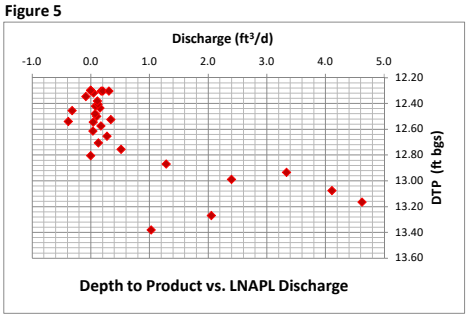


Figure 6

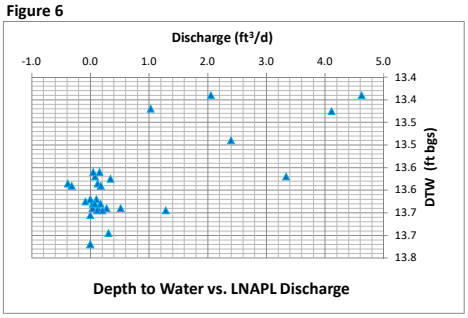


Figure 7

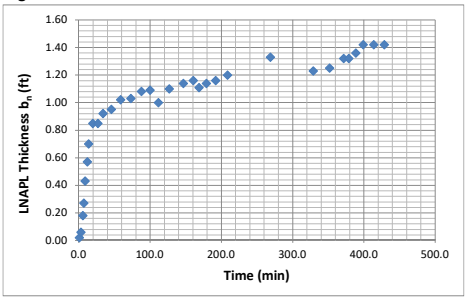


Figure 8

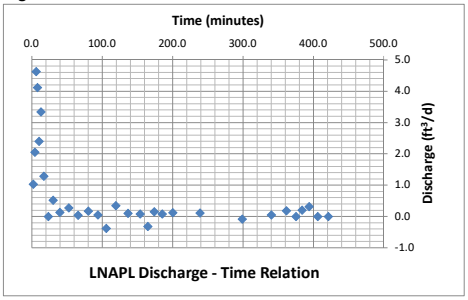


Figure 9

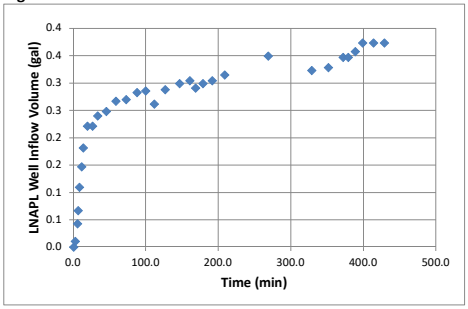
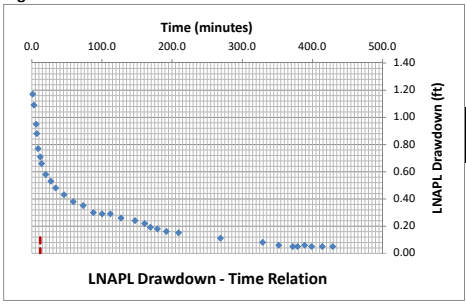


Figure 10



t (min)	s_n (ft)
12	0.115
12	0

Generalized Bouwer and Rice (1976)

Well Designation:	TW-18
Date:	15-Dec-18

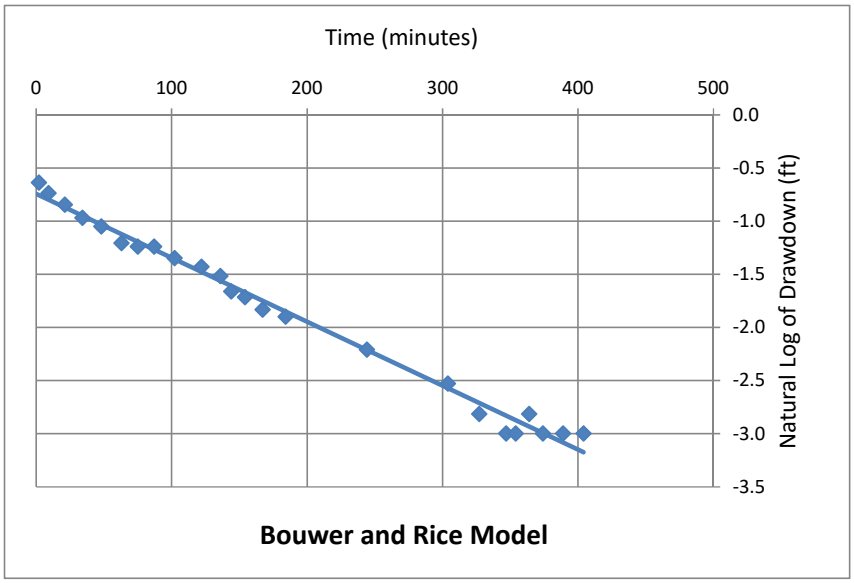
$$T_n = \frac{r_e^{\,2}\,\ln(R/r_e)\ln(s_n(t_1)/s_n(t))}{2(-J)(t-t_1)}$$

Enter early time cut-off for least-squares model fit

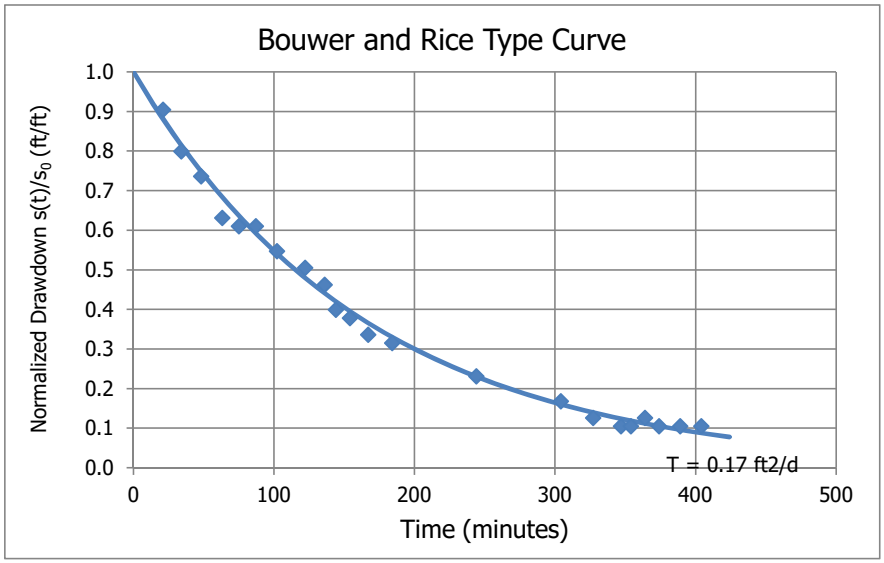
$Time_{cut}$	25	<- Enter or change value here

Model Results:	T_n (ft^2/d) = 0.18	+/-	0.00	ft^2/d

L_e/r_e	81.7
C	4.08
R/r_e	28.14
J-Ratio	-0.929
Coef. Of Variation	0.02



C coefficient calculated from Eq. 6.5(c) of Butler, The Design, Performance, and Analysis of Slug Tests, CRC Press, 2000.



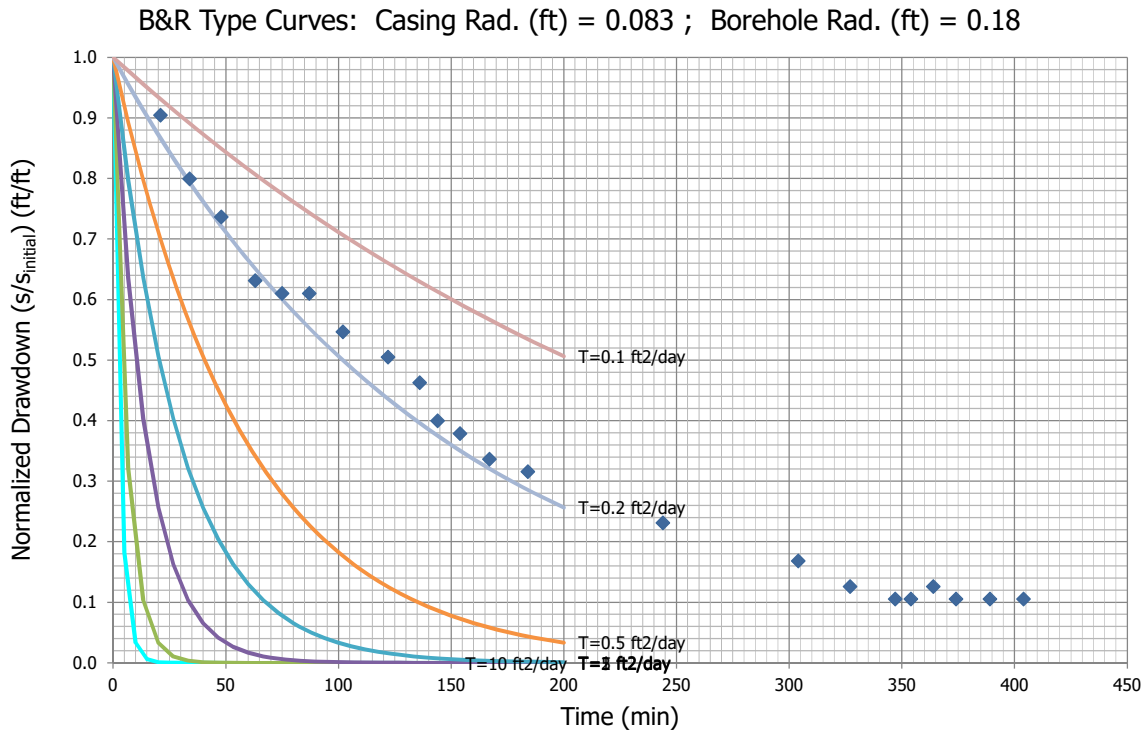
Bouwer and Rice Short Term LNAPL Mobility Test Type Curves

B&R Type Curves: Casing Rad. (ft) = 0.083 ; Borehole Rad. (ft) = 0.18

Enter these values

Type Curve ID	Type Curve Name	Notes	Max Time (min)	Transmissivity (ft^2/day)
1	T=10 ft2/day		150	10
2	T=5 ft2/day		200	5
3	T=2 ft2/day		200	2
4	T=1 ft2/day		200	1
5	T=0.5 ft2/day		200	0.5
6	T=0.2 ft2/day		200	0.2
7	T=0.1 ft2/day		200	0.1

J-Ratio	
-0.929	<-- If uncertain use
	-0.22



Well Designation:	TW-19	Beckett and Lyverse (2002)
Date:	15-Dec-18	

Ground Surface Elev (ft msl)	0.0	Enter These Data	**Drawdown Adjustment (ft)**
Top of Casing Elev (ft msl)	0.0		
Well Casing Radius, r_c (ft):	0.083	r_{e1}	0.36
Well Radius, r_w (ft):	0.180		
LNAPL Specific Yield, S_y:	0.175		
LNAPL Density Ratio, ρ_r:	0.780		
Top of Screen (ft bgs):	0.0		
Bottom of Screen (ft bgs):	0.0		
LNAPL Baildown Vol. (gal.):			
Effective Radius, r_{e3} (ft):	0.107	Calculated Parameters	
Effective Radius, r_{e2} (ft):	0.101		
Initial Casing LNAPL Vol. (gal.):	0.71		
Initial Filter LNAPL Vol. (gal.):	0.46		

Enter Data Here

	Time (min)	DTP (ft btoc)	DTW (ft btoc)	DTP (ft bgs)	DTW (ft bgs)	Water Table Depth (ft)	LNAPL Drawdown s_n (ft)	Average Time (min)	LNAPL Discharge Q_n (ft^3/d)	s_n (ft)	b_n (ft)	r_e (ft)
Initial Fluid Levels:	0	12.14	16.54	12.14	16.54	13.11					4.40	
Enter Test Data:	0.1	13.01	13.03	13.01	13.03	13.01	0.51				0.02	
	2.0	12.96	13.00	12.96	13.00	12.97	0.46	1.1	0.541	0.49	0.04	0.107
	4.0	12.89	13.00	12.89	13.00	12.91	0.39	3.0	1.798	0.43	0.11	0.107
	6.0	12.83	13.04	12.83	13.04	12.88	0.33	5.0	2.568	0.36	0.21	0.107
	8.0	12.80	13.11	12.80	13.11	12.87	0.30	7.0	2.568	0.32	0.31	0.107
	10.0	12.76	13.18	12.76	13.18	12.85	0.26	9.0	2.825	0.28	0.42	0.107
	12.0	12.72	13.26	12.72	13.26	12.84	0.22	11.0	3.082	0.24	0.54	0.107
	14.0	12.71	13.33	12.71	13.33	12.85	0.21	13.0	2.054	0.22	0.62	0.107
	16.0	12.68	13.37	12.68	13.37	12.83	0.18	15.0	1.798	0.20	0.69	0.107
	18.0	12.66	13.41	12.66	13.41	12.83	0.16	17.0	1.541	0.17	0.75	0.107
	20.0	12.66	13.45	12.66	13.45	12.83	0.16	19.0	1.027	0.16	0.79	0.107
	25.0	12.61	13.57	12.61	13.57	12.82	0.11	22.5	1.746	0.13	0.96	0.107
	27.0	12.61	13.59	12.61	13.59	12.83	0.11	26.0	0.514	0.11	0.98	0.107
	32.0	12.59	13.66	12.59	13.66	12.83	0.09	29.5	0.925	0.10	1.07	0.107
	37.0	12.58	13.74	12.58	13.74	12.84	0.08	34.5	0.925	0.08	1.16	0.107
	42.0	12.56	13.76	12.56	13.76	12.82	0.06	39.5	0.411	0.07	1.20	0.107
	47.0	12.56	13.80	12.56	13.80	12.83	0.06	44.5	0.411	0.06	1.24	0.107
	52.0	12.54	13.83	12.54	13.83	12.82	0.04	49.5	0.514	0.05	1.29	0.107
	62.0	12.54	13.89	12.54	13.89	12.84	0.04	57.0	0.308	0.04	1.35	0.107
	72.0	12.53	13.89	12.53	13.89	12.83	0.03	67.0	0.051	0.03	1.36	0.107
	92.0	12.52	13.91	12.52	13.91	12.83	0.02	82.0	0.077	0.02	1.39	0.107
	122.0	12.51	13.94	12.51	13.94	12.82	0.01	107.0	0.068	0.01	1.43	0.107
	152.0	12.51	13.95	12.51	13.95	12.83	0.01	137.0	0.017	0.01	1.44	0.107

Figure 1

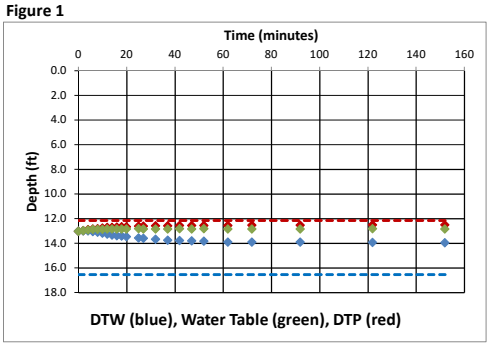
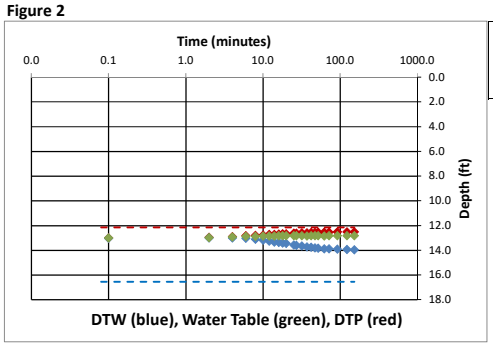


Figure 2



0.1	12.14
152	12.14
0.1	16.54
152	16.54

38.0	#N/A
38.0	#N/A

Figure 3

Q_n (ft³/d)	s_n (ft)
0	0
5	0.6

Drawdown Adjust.	
Δs_n (ft)	0.36

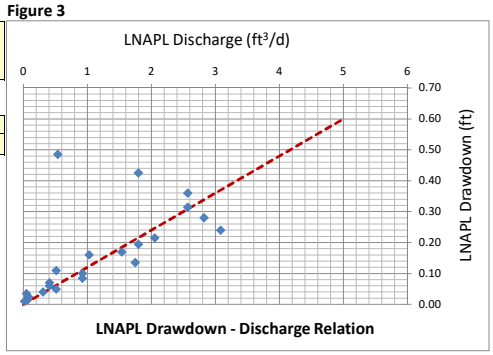


Figure 4

b_n	s_n
1.5	0
0	0.38

J-ratio	-0.253

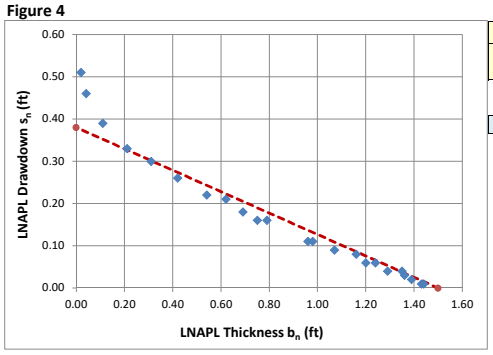


Figure 5

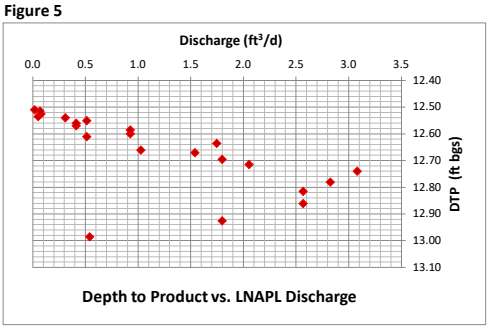


Figure 6

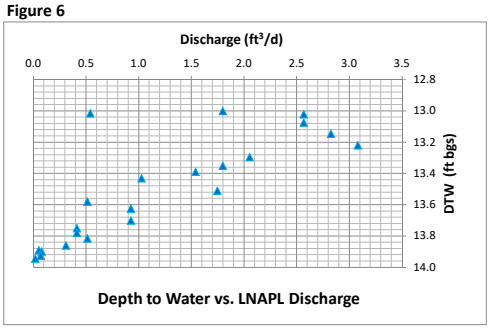


Figure 7

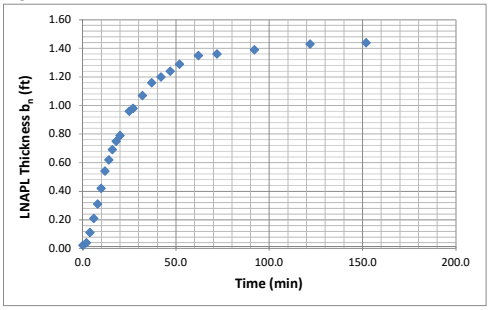


Figure 8

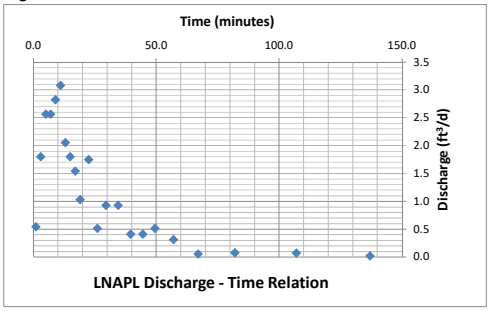


Figure 9

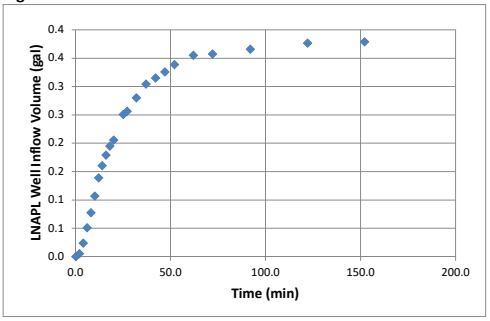
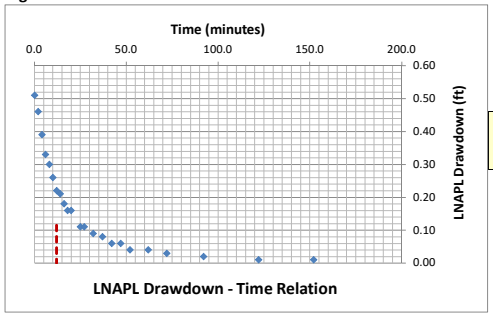


Figure 10



t (min)	s_n (ft)
12	0.115
12	0

Generalized Bouwer and Rice (1976)

Well Designation:	TW-19
Date:	15-Dec-18

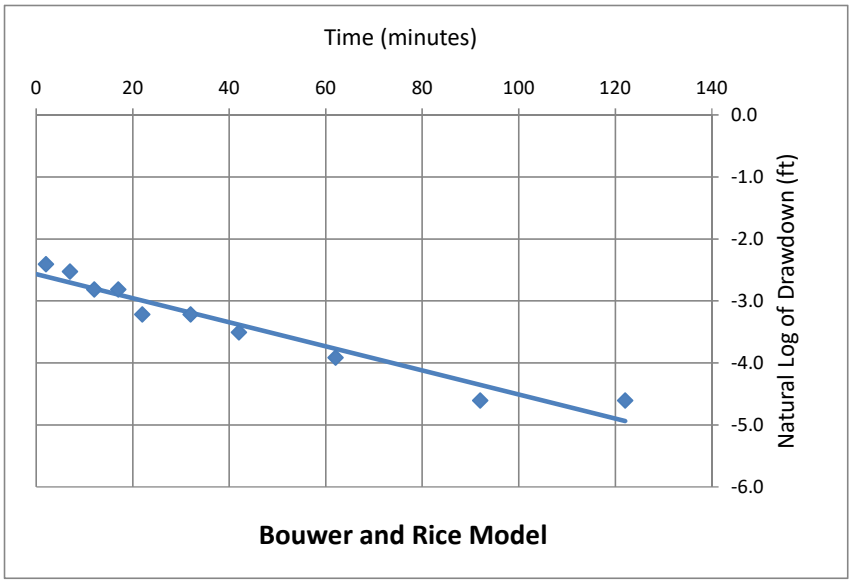
$$T_n = \frac{r_e^{\,2}\,\ln(R/r_e)\ln(s_n(t_1)/s_n(t))}{2(-J)(t-t_1)}$$

Enter early time cut-off for least-squares model fit

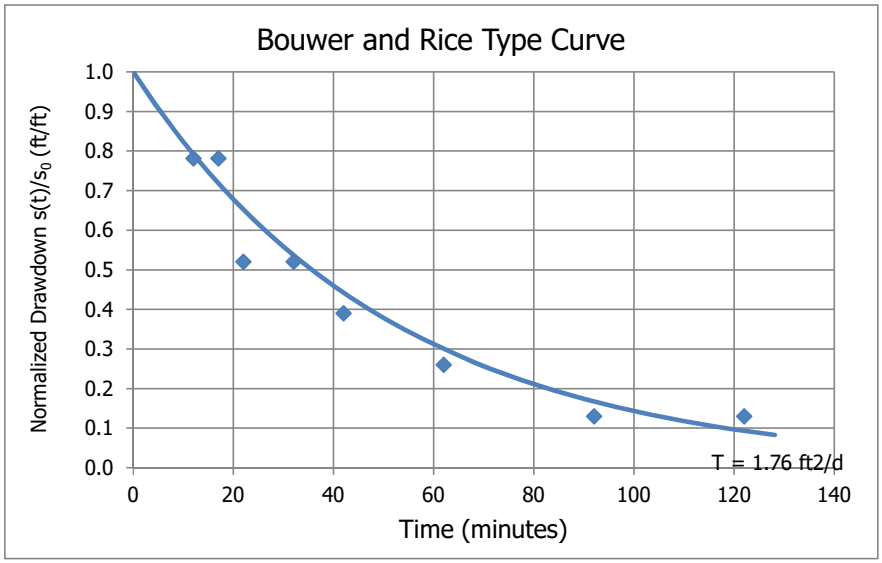
$Time_{cut}$	30	<- Enter or change value here

Model Results:	T_n (ft^2/d) = 1.77	+/-	0.16	ft^2/d

L_e/r_e	41.3
C	2.44
R/r_e	16.75
J-Ratio	-0.253
Coef. Of Variation	0.09



C coefficient calculated from Eq. 6.5(c) of Butler, The Design, Performance, and Analysis of Slug Tests, CRC Press, 2000.



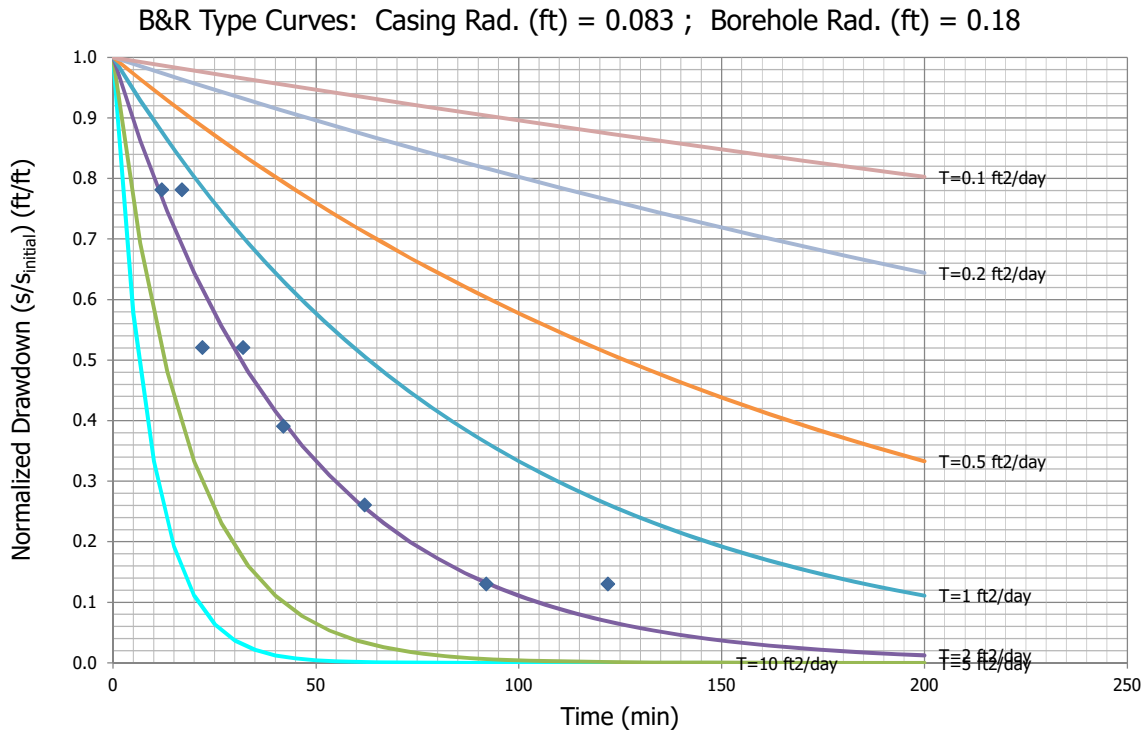
Bouwer and Rice Short Term LNAPL Mobility Test Type Curves

B&R Type Curves: Casing Rad. (ft) = 0.083 ; Borehole Rad. (ft) = 0.18

Enter these values

Type Curve ID	Type Curve Name	Notes	Max Time (min)	Transmissivity (ft^2/day)
1	T=10 ft2/day		150	10
2	T=5 ft2/day		200	5
3	T=2 ft2/day		200	2
4	T=1 ft2/day		200	1
5	T=0.5 ft2/day		200	0.5
6	T=0.2 ft2/day		200	0.2
7	T=0.1 ft2/day		200	0.1

J-Ratio	
-0.253	<-- If uncertain use
	-0.22



Well Designation:	TW-24	Beckett and Lyverse (2002)
Date:	15-Dec-18	

Ground Surface Elev (ft msl)	0.0	Enter These Data	**Drawdown Adjustment (ft)**
Top of Casing Elev (ft msl)	0.0		
Well Casing Radius, r_c (ft):	0.031	r_{e1}	
Well Radius, r_w (ft):	0.180		0.11
LNAPL Specific Yield, S_y:	0.175		
LNAPL Density Ratio, ρ_r:	0.780		
Top of Screen (ft bgs):	5.0		
Bottom of Screen (ft bgs):	25.0		
LNAPL Baildown Vol. (gal.):	4.0		
Effective Radius, r_{e3} (ft):	0.080	Calculated Parameters	
Effective Radius, r_{e2} (ft):	0.057		
Initial Casing LNAPL Vol. (gal.):	0.04		
Initial Filter LNAPL Vol. (gal.):	0.26		

Enter Data Here

	Time (min)	DTP (ft btoc)	DTW (ft btoc)	DTP (ft bgs)	DTW (ft bgs)	Water Table Depth (ft)	LNAPL Drawdown s_n (ft)	Average Time (min)	LNAPL Discharge Q_n (ft^3/d)	s_n (ft)	b_n (ft)	r_e (ft)
Initial Fluid Levels:	0	14.51	16.49	14.51	16.49	14.95					1.98	
Enter Test Data:	1.0	14.98	14.99	14.98	14.99	14.98	0.36				0.01	
	3.0	14.86	14.88	14.86	14.88	14.86	0.24	2.0	0.146	0.30	0.02	0.080
	5.0	14.79	14.90	14.79	14.90	14.81	0.17	4.0	1.316	0.21	0.11	0.080
	7.0	14.76	14.94	14.76	14.94	14.80	0.14	6.0	1.023	0.16	0.18	0.080
	9.0	14.74	14.96	14.74	14.96	14.79	0.12	8.0	0.585	0.13	0.22	0.080
	11.0	14.74	14.96	14.74	14.96	14.79	0.12	10.0	0.000	0.12	0.22	0.080
	13.0	14.74	14.96	14.74	14.96	14.79	0.12	12.0	0.000	0.12	0.22	0.080
	18.0	14.73	14.99	14.73	14.99	14.79	0.11	15.5	0.234	0.12	0.26	0.080
	23.0	14.72	14.99	14.72	14.99	14.78	0.10	20.5	0.058	0.11	0.27	0.080
	28.0	14.71	14.99	14.71	14.99	14.77	0.09	25.5	0.058	0.10	0.28	0.080
	33.0	14.70	14.99	14.70	14.99	14.76	0.08	30.5	0.058	0.09	0.29	0.080
	40.0	14.70	14.99	14.70	14.99	14.76	0.08	36.5	0.000	0.08	0.29	0.080
	50.0	14.69	14.99	14.69	14.99	14.76	0.07	45.0	0.029	0.07	0.30	0.080
	60.0	14.69	15.02	14.69	15.02	14.76	0.07	55.0	0.088	0.07	0.33	0.080
	70.0	14.69	15.02	14.69	15.02	14.76	0.07	65.0	0.000	0.07	0.33	0.080
	90.0	14.69	15.03	14.69	15.03	14.76	0.07	80.0	0.015	0.07	0.34	0.080
	164.0	14.67	15.02	14.67	15.02	14.75	0.05	127.0	0.004	0.06	0.35	0.080
	224.0	14.63	15.02	14.63	15.02	14.72	0.01	194.0	0.019	0.03	0.39	0.080

Figure 1

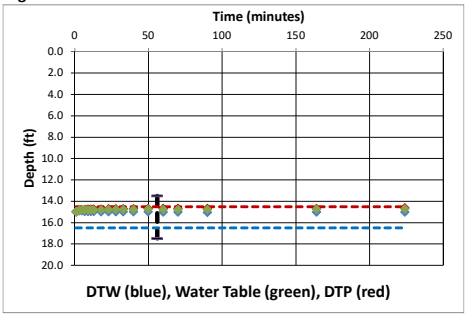
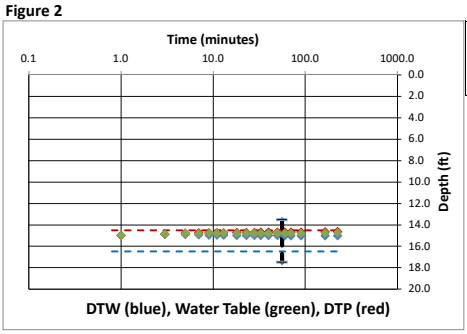


Figure 2



0.8	14.51
224	14.51
0.8	16.49
224	16.49

56.0	13.51	13.5
56.0	17.5	17.5

Figure 3

Q_n (ft^3/d)	s_n (ft)
0	0
0.15	0.2

Drawdown Adjust.	
Δs_n (ft)	0.11

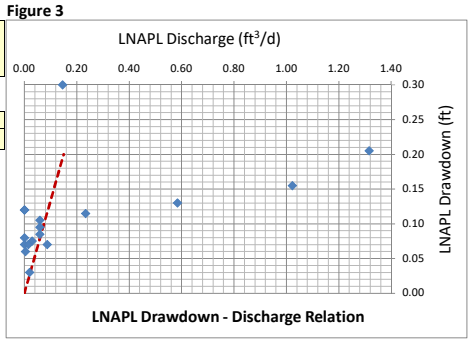


Figure 4

b_n	s_n
0.43	0
0	0.25

J-ratio	-0.581

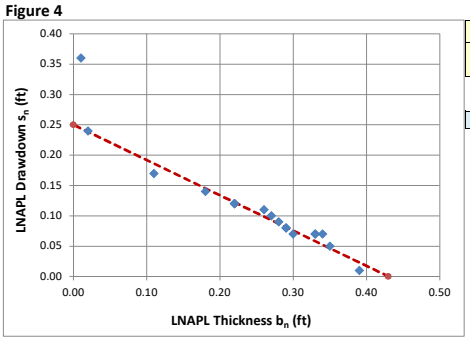


Figure 5

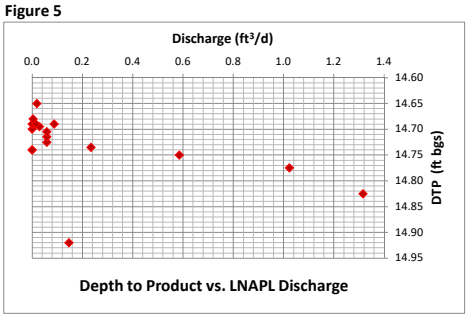


Figure 6

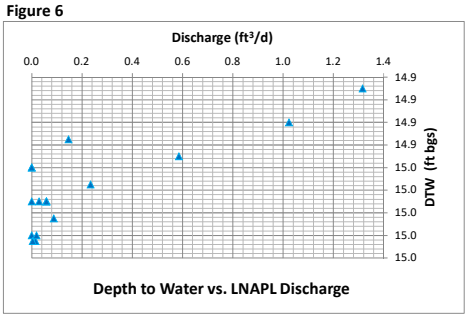


Figure 7

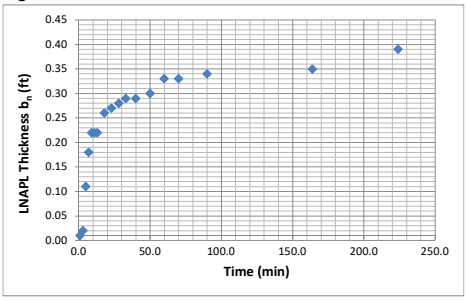


Figure 8

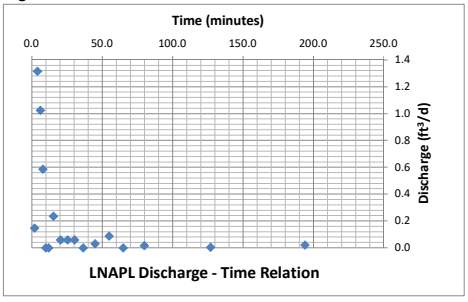


Figure 9

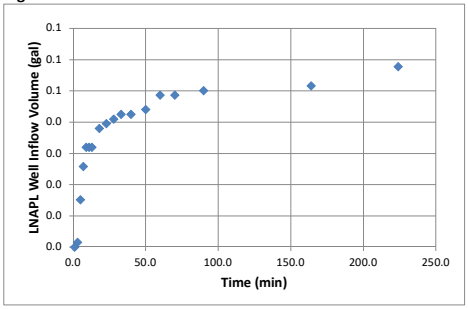
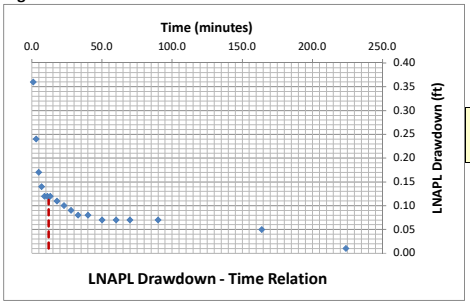


Figure 10



t (min)	s_n (ft)
12	0.115
12	0

Generalized Bouwer and Rice (1976)

Well Designation:	TW-24
Date:	15-Dec-18

$$T_n = \frac{r_e^{\,2}\,\ln(R/r_e)\ln(s_n(t_1)/s_n(t))}{2(-J)(t-t_1)}$$

Enter early time cut-off for least-squares model fit

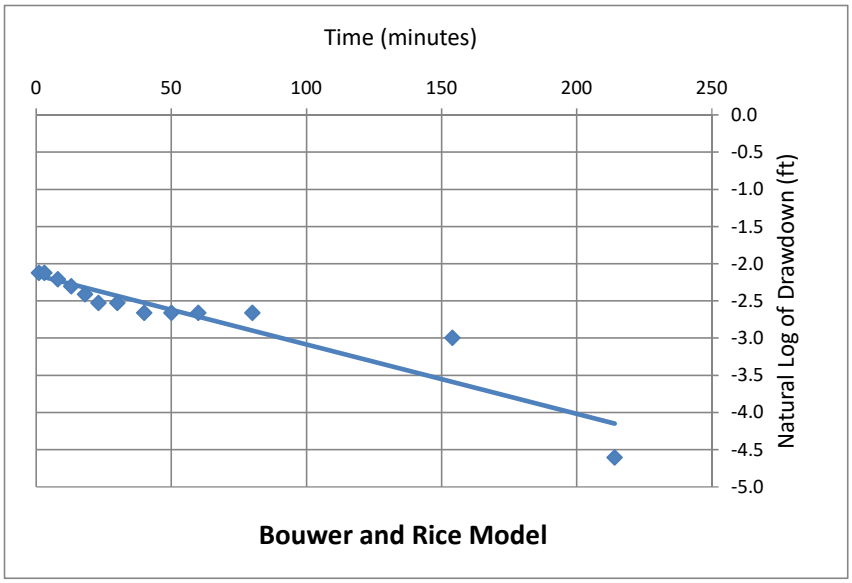
$Time_{cut}$	10	<- Enter or change value here

Model Results: T_n (ft^2/d) = 0.18 +/- 0.02 ft^2/d

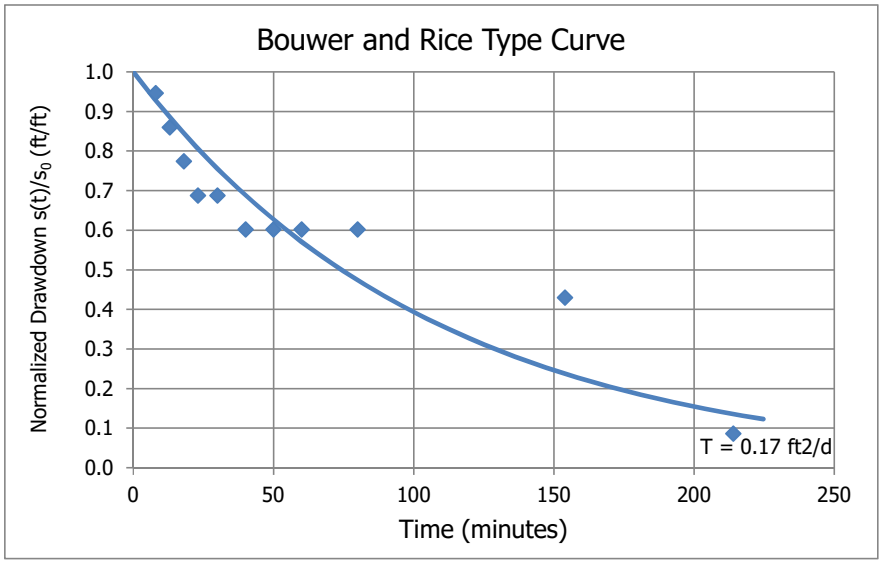
L_e/r_e
24.6
C
1.78
R/r_e
11.10

J-Ratio
-0.581

Coef. Of Variation
0.12



C coefficient calculated from Eq. 6.5(c) of Butler, The Design, Performance, and Analysis of Slug Tests, CRC Press, 2000.



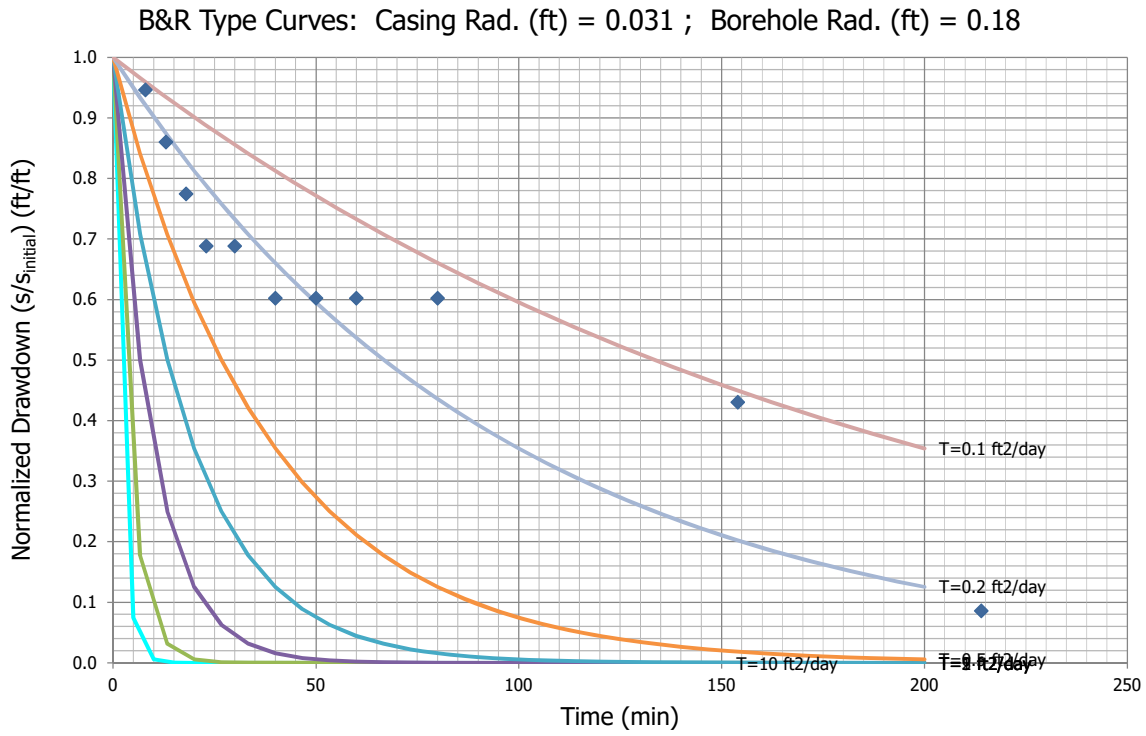
Bouwer and Rice Short Term LNAPL Mobility Test Type Curves

B&R Type Curves: Casing Rad. (ft) = 0.031 ; Borehole Rad. (ft) = 0.18

Enter these values

Type Curve ID	Type Curve Name	Notes	Max Time (min)	Transmissivity (ft^2/day)
1	T=10 ft2/day		150	10
2	T=5 ft2/day		200	5
3	T=2 ft2/day		200	2
4	T=1 ft2/day		200	1
5	T=0.5 ft2/day		200	0.5
6	T=0.2 ft2/day		200	0.2
7	T=0.1 ft2/day		200	0.1

J-Ratio	
-0.581	<-- If uncertain use
	-0.22



APPENDIX H
Groundwater Field Sample Forms

EPS

Monitoring Well Sampling Form

EPS Project: Transco **Date:** January 22, 2019

Well ID: MW-1 **Field Conditions:** Sunny, 34°F, ENE 10mph

Sampling Performed By: J. Terry, B. McGann

Well Construction: Stick up **General Condition of Well:** good

Well Labeled: Y **Well Cap:** Y **Well Locked:** Y **Condition of surrounding area:** unimproved (field)

Well depth from TOC: 19.40 **Depth to Water from TOC:** 9.88

Well Diameter (in): 2 **Method of measure:** Water Level Meter

Height (Ht) of water in well (Well depth from TOC - Static level from TOC): 9.52

Volume of water in well (Ht. x (0.04 for 1")(.16 for 2")(.653 for 4")(1.469 for 6"): 1.5 **Three Well Volumes (gal):** 4.5

Purging Method: Multiple Volume Rate: 0.1 GPM **Time @ Start of Purge:** 0835

Sample Method: direct / transfer cap assembly 0.08gpm @0908 **Sample Parameters:** PAHs (SIM method)

Initial Depth of Pump/Tubing: 11.00 ft (BTOC) **Final Depth of Pump/Tubing:** 13.00 ft (BTOC)

Time	Volume (gal)	Temp (°C)	pH	Cond. (mS/cm)	DO (mg/L)	Turbidity (NTU)	ORP (mV)	DTW (ft, BTOC)	Comments
0850	1.5	14	4.90	0.199	1.23	9.9	194.3	11.38	
0900	2.5	14.5	4.92	0.201	1.35	15.5	227.3	11.99	
0908	3.3	14.3	4.99	0.203	1.46	8.5	238.4	12.12	Reduced purge rate: 0.08
0920	4.3	14.3	5.05	0.207	1.39	3.7	246.5	12.12	
0930	5.1	14.3	5.10	0.210	1.45	2.3	251.6	12.15	
0940	5.9	13.9	5.10	0.211	1.36	1.7	256.7	12.15	
0950	6.7	14.3	5.08	0.212	1.41	1.2	258.1	12.15	

WQ Meter Make/Model/SN: YSI ProPlus 18E106564

Pump Make/Model: Alexis Peristaltic

Turbidity Meter Make/Model/SN: LaMotte 2020we 9835-1018

Sample ID: 19022-MW-1 Time Collected: 0950

19022-Dup 1200

Technician Signature

EPS

Monitoring Well Sampling Form

EPS Project: Transco — **Date: January 22, 2019**

Well ID: TW-1 — **Field Conditions:** 33°F, sunny

Sampling Performed By: J. Terry, B. McGann

Well Construction: STICK-UP — **General Condition of Well:** good

Well Labeled: ✓ — **Well Cap:** ✓ — **Well Locked:** ✓ — **Condition of surrounding area:** Unimproved surface

Well depth from TOC: 20 — **Depth to Water from TOC:** 10.91

Well Diameter (in): 2 in. — **Method of measure:** Water Level Meter

Height (Ht) of water in well (Well depth from TOC - Static level from TOC): 9.09

Volume of water in well (Ht. x (0.04 for 1")(.16 for 2")(.653 for 4")(1.469 for 6"): 1.45 — **Three Well Volumes (gal):** 4.36

Purging Method: Multiple Volume — **Time @ Start of Purge:** 0820

Sample Method: direct / transfer cap assembly — **Sample Parameters:** PAHs (SIM method)

Initial Depth of Pump/Tubing: 18 ft (BTOC) — **Final Depth of Pump/Tubing:** 18 ft (BTOC)

Time	Volume (gal)	Temp (°C)	pH	Cond. (mS/cm)	DO (mg/L)	Turbidity (NTU)	ORP (mV)	DTW (ft, BTOC)	Comments
0835	1.35	16.1	5.04	0.115	2.68	8.38	225.9	12.46	0.04 gal/min purge rate
0845	2.25	15.9	5.04	0.111	8.78	6.66	175.0	12.96	
0855	3.15	16.1	5.04	0.112	9.09	4.27	176.2	12.92	
0905	4.05	16.3	5.06	0.110	9.16	4.58	174.4	12.92	
0915	4.95	16.3	5.06	0.111	9.00	3.59	174.8	12.92	

WQ Meter Make/Model/SN: YSI ProPlus 18B104560

Pump Make/Model: Alexis Peristaltic 24475

Turbidity Meter Make/Model/SN: LaMotte 2020we 9710-1118

Sample ID: 19022-TW-1 — Time Collected: 0920 — Technician Signature

EPS

Monitoring Well Sampling Form

EPS Project: Transco **Date:** January 22, 2019

Well ID: TW-8 **Field Conditions:** Sunny, 44°F, E 10mph

Sampling Performed By: J. Terry, B. McGann

Well Construction: Stick up **General Condition of Well:** good

Well Labeled: Y **Well Cap:** Y **Well Locked:** N after lock **Condition of surrounding area:** unimproved (field)

Well depth from TOC: 22.94 **Depth to Water from TOC:** 14.89

Well Diameter (in): 2 **Method of measure:** Water Level Meter

Height (Ht) of water in well (Well depth from TOC - Static level from TOC): 8.05

Volume of water in well (Ht. x (0.04 for 1")(.16 for 2")(.653 for 4")(1.469 for 6"): 1.3 **Three Well Volumes (gal):** 3.9

Purging Method: Multiple Volume Rate: 0.1GPM **Time @ Start of Purge:** 1200

Sample Method: direct / transfer cap assembly **Sample Parameters:** PAHs (SIM method)

Initial Depth of Pump/Tubing: 16 ft (BTOC) **Final Depth of Pump/Tubing:** 16 ft (BTOC)

Time	Volume (gal)	Temp (°C)	pH	Cond. (mS/cm)	DO (mg/L)	Turbidity (NTU)	ORP (mV)	DTW (ft, BTOC)	Comments
1210	0.8	19.7	6.43	0.60	1.33	625	-73.2	16.41	
1220	1.8	20.0	6.35	0.62	0.47	28.4	-70.5	16.41	
1230	2.8	20.2	6.35	0.63	0.35	5.64	-67.7	16.41	
1240	3.8	20.3	6.35	0.63	0.49	1.41	-67.9	16.41	
1250	4.8	20.2	6.34	0.62	0.51	1.74	-67.5	16.41	

WQ Meter Make/Model/SN: YSI ProPlus 18E106564

Pump Make/Model: Alexis Peristaltic

Turbidity Meter Make/Model/SN: LaMotte 2020we 9835-1018

Sample ID: 19022-TW-8 Time Collected: 1255 Technician Signature

EPS

Monitoring Well Sampling Form

EPS Project: Transco **Date: January 22, 2019**

Well ID: TW-31 **Field Conditions:** 39° F, SUNNY

Sampling Performed By: J. Terry, B. McGann

Well Construction: Stick-up **General Condition of Well:** good

Well Labeled: ✓ **Well Cap:** ✓ **Well Locked:** NA **Condition of surrounding area:** unimproved surface

Well depth from TOC: 22.62 **Depth to Water from TOC:** 6.51

Well Diameter (in): 1 in. **Method of measure:** Water Level Meter

Height (Ht) of water in well (Well depth from TOC - Static level from TOC): 16.11

Volume of water in well (Ht. x (0.04 for 1")(.16 for 2")(.653 for 4")(1.469 for 6"): 0.64 **Three Well Volumes (gal):** 1.93

Purging Method: Multiple Volume **Time @ Start of Purge:** 1015

Sample Method: direct / transfer cap assembly **Sample Parameters:** PAHs (SIM method)

Initial Depth of Pump/Tubing: 15 ft (BTOC) **Final Depth of Pump/Tubing:** 15 ft (BTOC)

Time	Volume (gal)	Temp (°C)	pH	Cond. (mS/cm)	DO (mg/L)	Turbidity (NTU)	ORP (mV)	DTW (ft, BTOC)	Comments
1030	1.2	16.9	5.94	0.486	0.58	6.71	115.3	8.64	0.08 gal/min purge rate
1040	2.0	17.0	5.97	0.485	0.28	6.06	108.3	8.76	
1050	2.5	16.8	6.01	0.489	0.24	9.59	106.1	8.12	@ 1040 pump rate slowed to 0.05 GPM to reduce further drawdown
1100	3.0	16.8	5.97	0.484	0.21	5.48	105.6	8.15	
1110	3.5	17.0	6.00	0.482	0.16	6.01	104.9	8.16	

WQ Meter Make/Model/SN: YSI ProPlus 18B104560

Pump Make/Model: Alexis Peristaltic 24.475

Turbidity Meter Make/Model/SN: LaMotte 2020we 9710-1118

Sample ID: 19022-TW-31 Time Collected: 1115 Technician Signature

EPS

Monitoring Well Sampling Form

EPS Project: Transco **Date:** January 22, 2019

Well ID: TW-33 **Field Conditions:** Sunny, 37°F, E 10 mph

Sampling Performed By: J. Terry, B. McGann

Well Construction: stick up **General Condition of Well:** good

Well Labeled: Y **Well Cap:** Y **Well Locked:** N **Condition of surrounding area:** unimproved

Well depth from TOC: 23.07 **Depth to Water from TOC:** 11.72

Well Diameter (in): 1 **Method of measure:** Water Level Meter

Height (Ht) of water in well (Well depth from TOC - Static level from TOC): 11.35

Volume of water in well (Ht. x (0.04 for 1")(.16 for 2")(.653 for 4")(1.469 for 6"): 0.5 **Three Well Volumes (gal):** 1.5

Purging Method: Multiple Volume Rate: 0.06 GPM **Time @ Start of Purge:** 1040

Sample Method: direct / transfer cap assembly **Sample Parameters:** PAHs (SIM method)

Initial Depth of Pump/Tubing: 13 ft (BTOC) **Final Depth of Pump/Tubing:** 13 ft (BTOC)

Time	Volume (gal)	Temp (°C)	pH	Cond. (mS/cm)	DO (mg/L)	Turbidity (NTU)	ORP (mV)	DTW (ft, BTOC)	Comments
1050	0.6	16.8	6.44	0.64	0.29	4.1	-111.4	11.75	X(2)
1100	1.2	16.8	6.38	0.64	0.17	4.6	-112	11.75	
1110	1.8	16.9	6.43	0.66	0.11	2.9	-111.5	11.75	
1115	2.1	16.7	6.43	0.66	0.10	2.41	-110.8	11.75	
1120	2.4	17.3	6.42	0.67	0.08	2.2	-111.7	11.75	
1125	2.7	17.5	6.42	0.66	0.07	3.7	-112	11.75	

WQ Meter Make/Model/SN: YSI ProPlus 18E106564

Pump Make/Model: Alexis Peristaltic

Turbidity Meter Make/Model/SN: LaMotte 2020we 9835-1018

Sample ID: 19077-TW-33 Time Collected: 1125 Technician Signature: Joe Terry

ANALYTICAL ENVIRONMENTAL SERVICES, INC.
3080 Presidential Drive Atlanta, GA 30340-3704
Phone: (770) 457-8177 / Toll-Free: (800) 972-4889 / Fax: (770) 457-8188

AES

CHAIN OF CUSTODY

Work Order: _____

Date: 1-22-19 Page 1 of 1

COMPANY: EPS

ADDRESS: 400 Northridge Rd, Ste 400
Sandy Springs, GA 30350

PHONE: 404-315-9113

EMAIL: awilliams@enplanning.com

SAMPLED BY: Joe Terry, Brian McGuinn

SIGNATURE: Joe Terry

#	SAMPLE ID	SAMPLED: DATE	SAMPLED: TIME	GRAB	COMPOSITE	MATRIX (see codes)	PAH SIM	PRESERVATION (see codes) I	REMARKS	Number of Containers
1	19022-MW-1	1-22-19	0950	X		GW	X	X		2
2	19022-TW-1	1-22-19	0920	X		GW	X	X		2
3	19022-TW-31	1-22-19	1115	X		GW	X	X		2
4	19022-TW-33	1-22-19	1125	X		GW	X	X		2
5	19022-TW-8	1-22-19	1255	X		GW	X	X		2
6	19022-Dup	1-22-19	1200	X		GW	X	X		2
7										
8										
9										
10										
11										
12										
13										
14										

ANALYSIS REQUESTED

Visit our website www.aesatlanta.com for downloadable COCs and to log in to your AESAccess account.

RELINQUISHED BY: DATE/TIME:
1. Joe Terry 1-22-19/1500
2.
3.

RECEIVED BY: DATE/TIME:
1. JW 1-22-19 1500
2.
3.

SPECIAL INSTRUCTIONS/COMMENTS:

SHIPMENT METHOD
OUT: / / VIA:
IN: / / VIA:
client FedEx UPS US mail courier Greyhound
other: _____

PROJECT INFORMATION
PROJECT NAME: Transco
PROJECT #:
SITE ADDRESS: Macon, GA
SEND REPORT TO: Aaron Williams
INVOICE TO:
(IF DIFFERENT FROM ABOVE)
QUOTE #: _____ PO#: _____

RECEIPT
Total # of Containers

Turnaround Time (TAT) Request
- [x] Standard 5 Business Days
- [ ] 2 Business Day Rush
- [ ] Next Business Day Rush
- [ ] Same-Day Rush **(auth req.)**
- [x] Other EDD

STATE PROGRAM (if any): _____
E-mail? ☐ Fax? ☐
DATA PACKAGE: I ○ II ○ III ○ IV ○

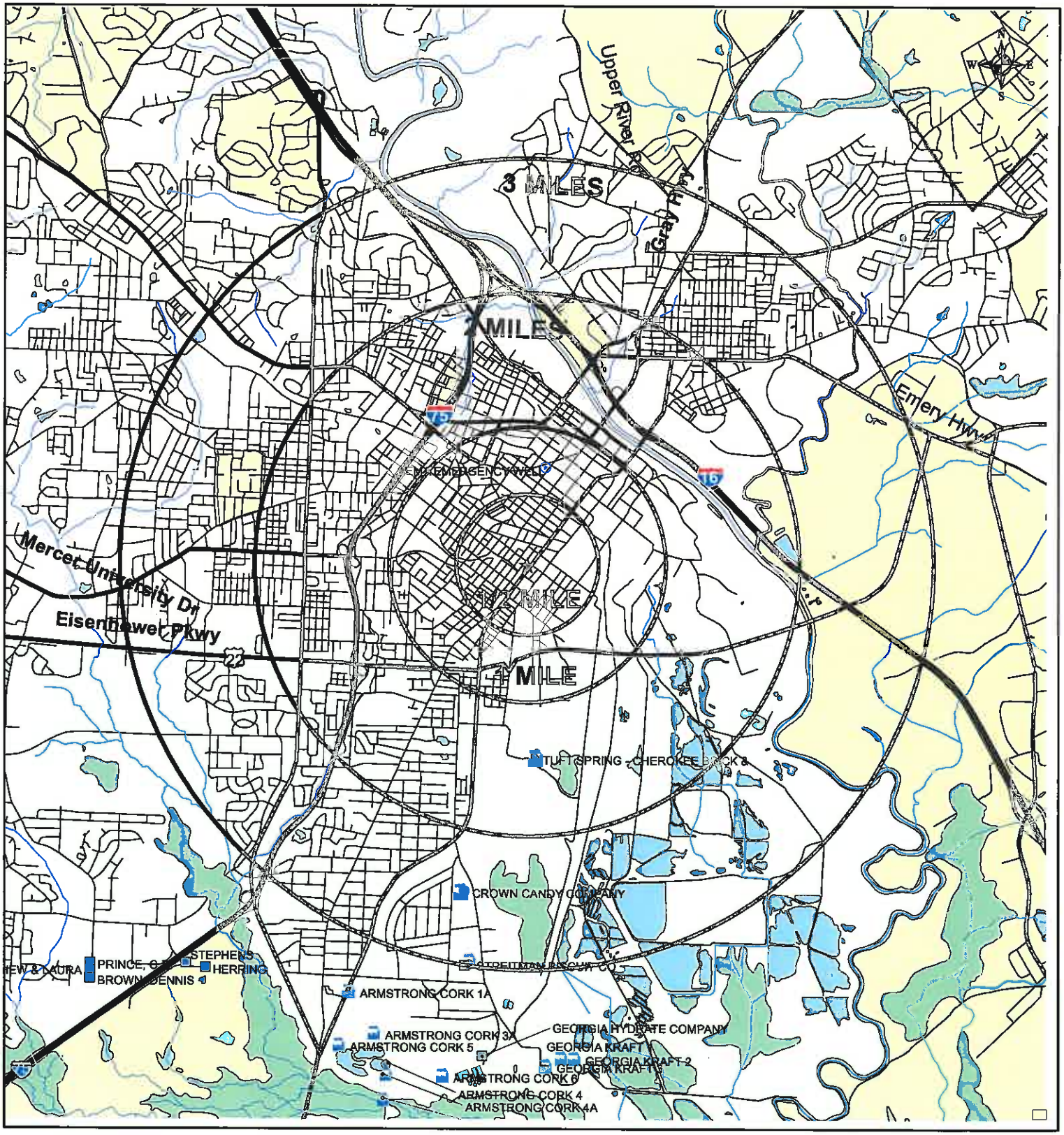
Submission of samples to the laboratory constitutes acceptance of AES's Terms & Conditions. Samples received after 3PM or on Saturday are considered as received the following business day. If no TAT is marked on COC, AES will proceed with standard TAT. Samples are disposed of 30 days after completion of report unless other arangements are made.

Matrix Codes: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water WW = Waste Water W = Water (Blanks) DW = Drinking Water (Blanks) O = Other (specify)

Preservative Codes: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

White Copy - Original; Yellow Copy - Client

APPENDIX I
Water Well Survey



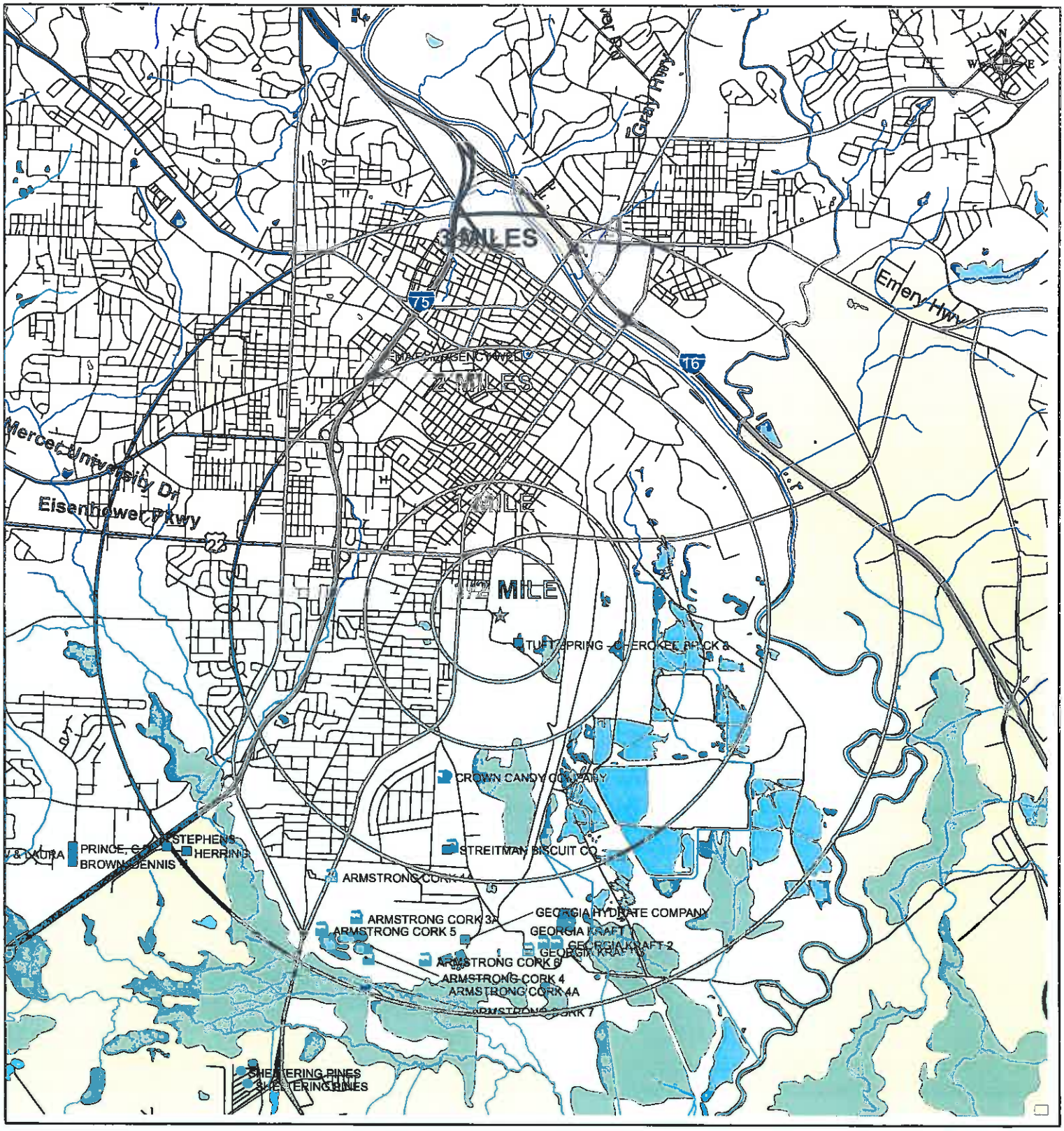
1217 Martin Luther King Jr. Boulevard
1217 Martin Luther King Jr. Boulevard
Macon, Bibb County

Scale: 1 inch = 1 mile
32 49 31 83 38' 03

Sources: Wells from USGS GWSI (1999); EPD WRB Non-Municipal Wells (1997); EPD HWMB field surveys (2004); Surface Water Intakes from EPD GSB DR96-27(1996); Roads, Rivers, Wetlands from Georgia DOT (2000); Census data from U.S. Bureau of Census (1990)

9/18/18 No Trip Report ~~yet~~ as of 10/26/18

30 pages



- Roads
- State and US Highways
- Interstate Highways
- Rivers/Streams
- Lake/Pond
- Swamp/Marsh
- Census Block Group Boundaries
- Census Block Group with >zero domestic well

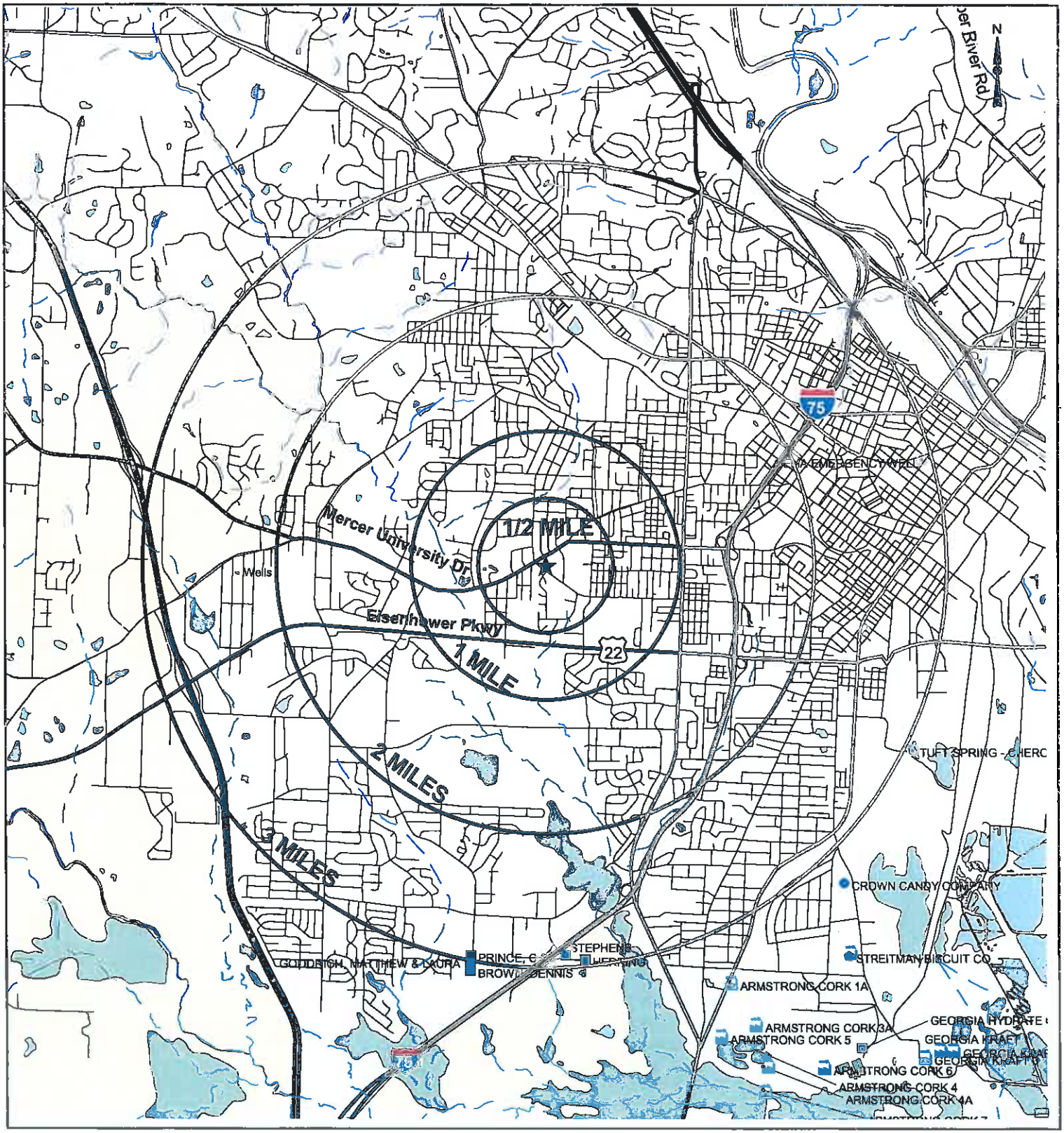
- *Public Supply*
- *INDUSTRIAL*
- *Drinking Water*
- *Household*

A & D Environmental Services
100 Waste Research Drive
Macon, Bibb County, Georgia

Scale: 1 inch = 1 mile
32 48 27 83 38' 06

Sources: Wells from USGS GWSI (1999); EPD WRB Non-Municipal Wells (1997); EPD HWMB field surveys (2004); Surface Water Intakes from EPD GSB DR96-27(1996); Roads, Rivers, Wetlands from Georgia DOT (2000); Census data from U.S. Bureau of Census (1990

6/15/15



Roads
State and US Highways
Interstate Highways
Rivers/Streams
Lake/Pond
Swamp/Marsh
Census Block Group Boundaries
Census Block Group with >zero domestic well

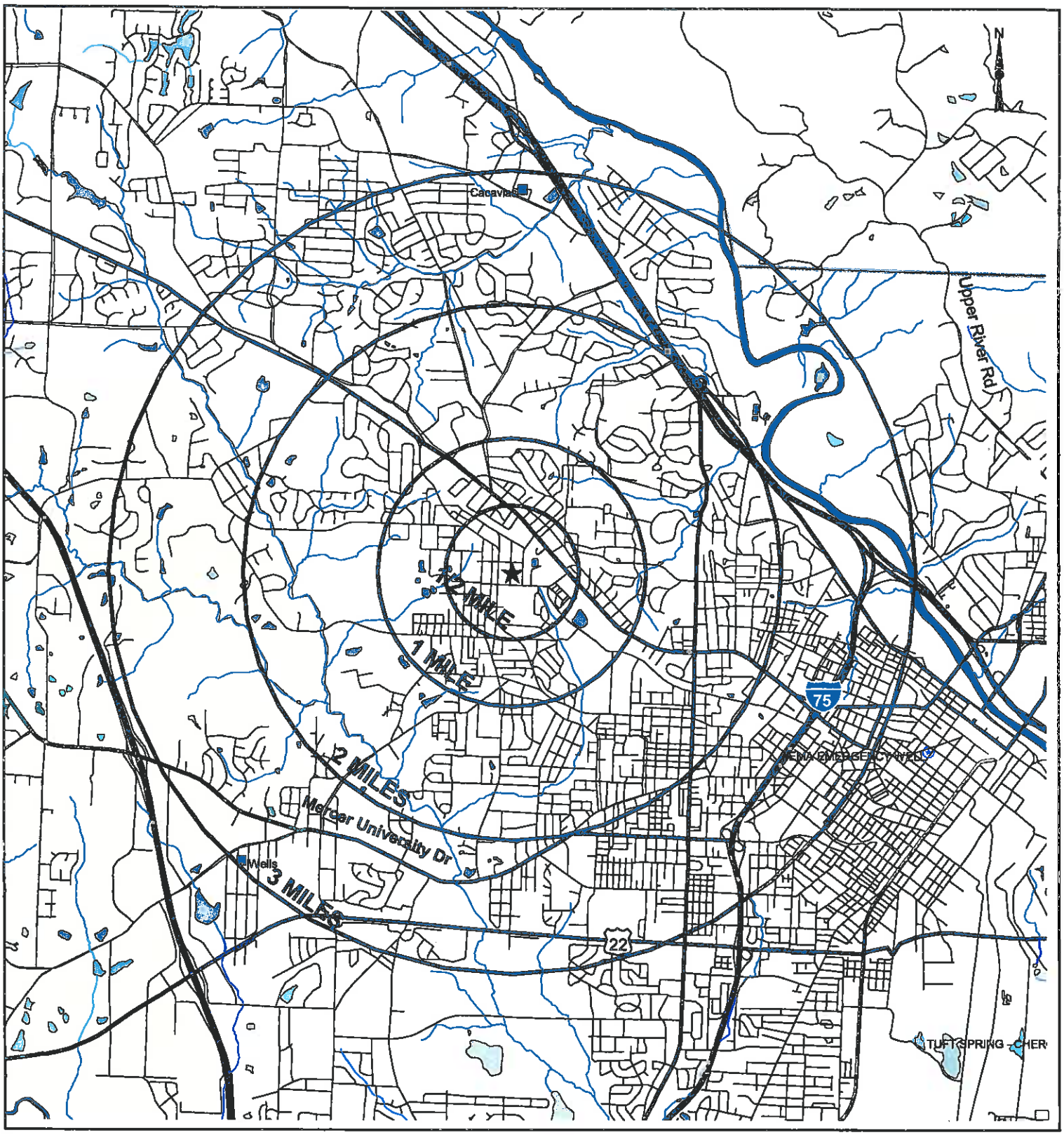
Public Supply
INDUSTRIAL
Drinking Water
Household
Commercial

Ace Automotive
3190 Mercer University Drive
Macon, Bibb County, Georgia

Scale: 1 inch = 1 mile
32 49 22" 83 40' 48"

Sources: Wells from USGS GWSI (1999); EPD WRB Non-Municipal Wells (1997); EPD HWMB field surveys (2004); Surface Water Intakes from EPD GSB DR96-27(1996); Roads, Rivers, Wetlands from Georgia DOT (2000); Census data from U.S. Bureau of Census (1990)

04/09/13



Roads
State and US Highways
Interstate Highways
Rivers/Streams
Lake/Pond
Swamp/Marsh
Census Block Group Boundaries
Census Block Group with >zero domestic well

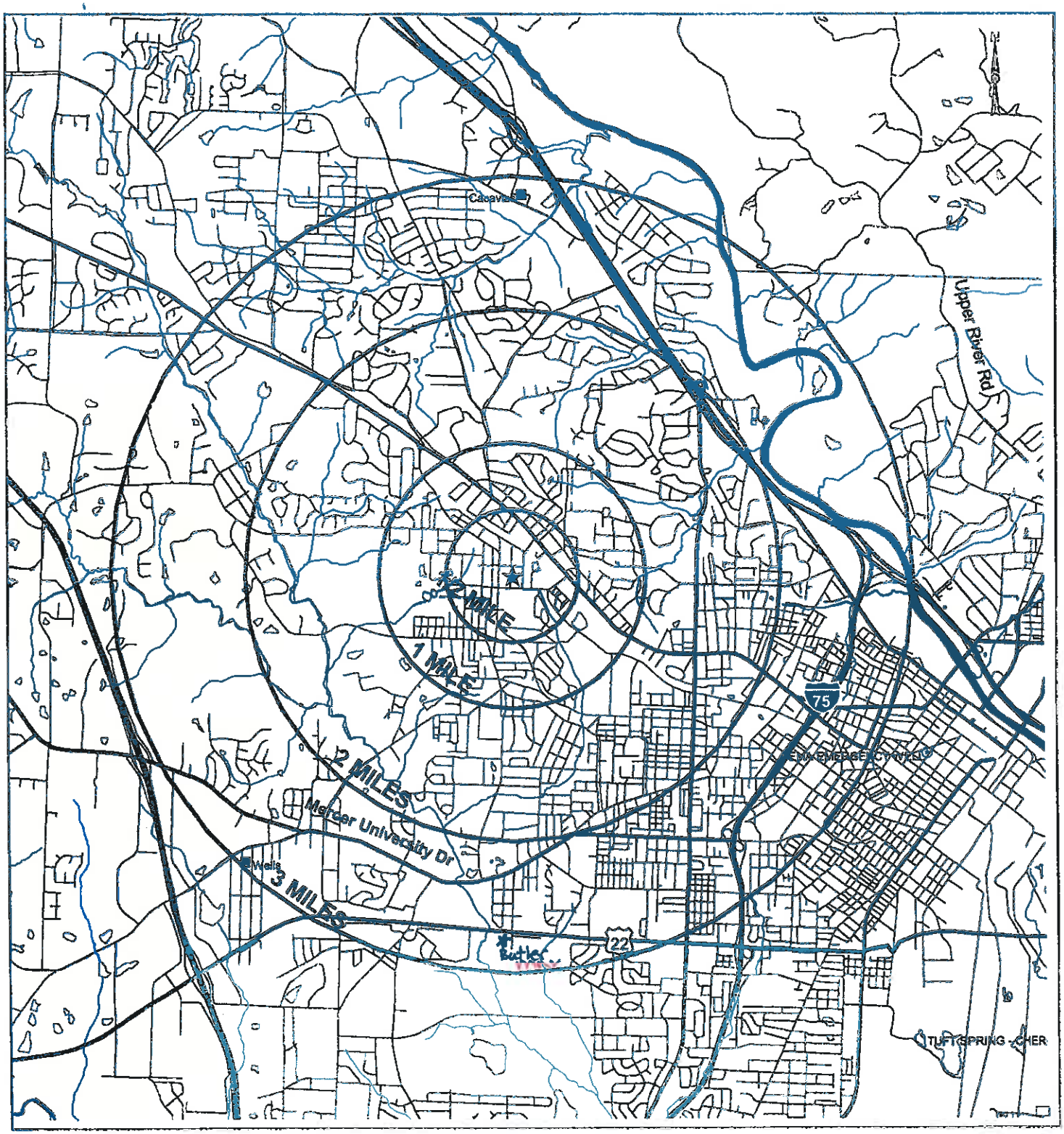
Drinking Water
HOUSEHOLD

Amerson Properties LTD
3855 Melrose Street
Macon, Bibb County

Scale: 1 inch = 1 mile
32 51' 07" 83 41' 09"

Sources: Wells from USGS GWSI (1999); EPD WRB Non-Municipal Wells (1997); EPD HWMB field surveys (1999); Surface Water Intakes from EPD GSB DR96-27(1996); Roads, Rivers, Wetlands from Georgia DOT (1993); Census data from U.S. Bureau of Census (1990)

4/21/03



Roads
State and US Highways
Interstate Highways
Rivers/Streams
Lake/Pond
Swamp/Marsh
Census Block Group Boundaries
Census Block Group with >zero domestic well

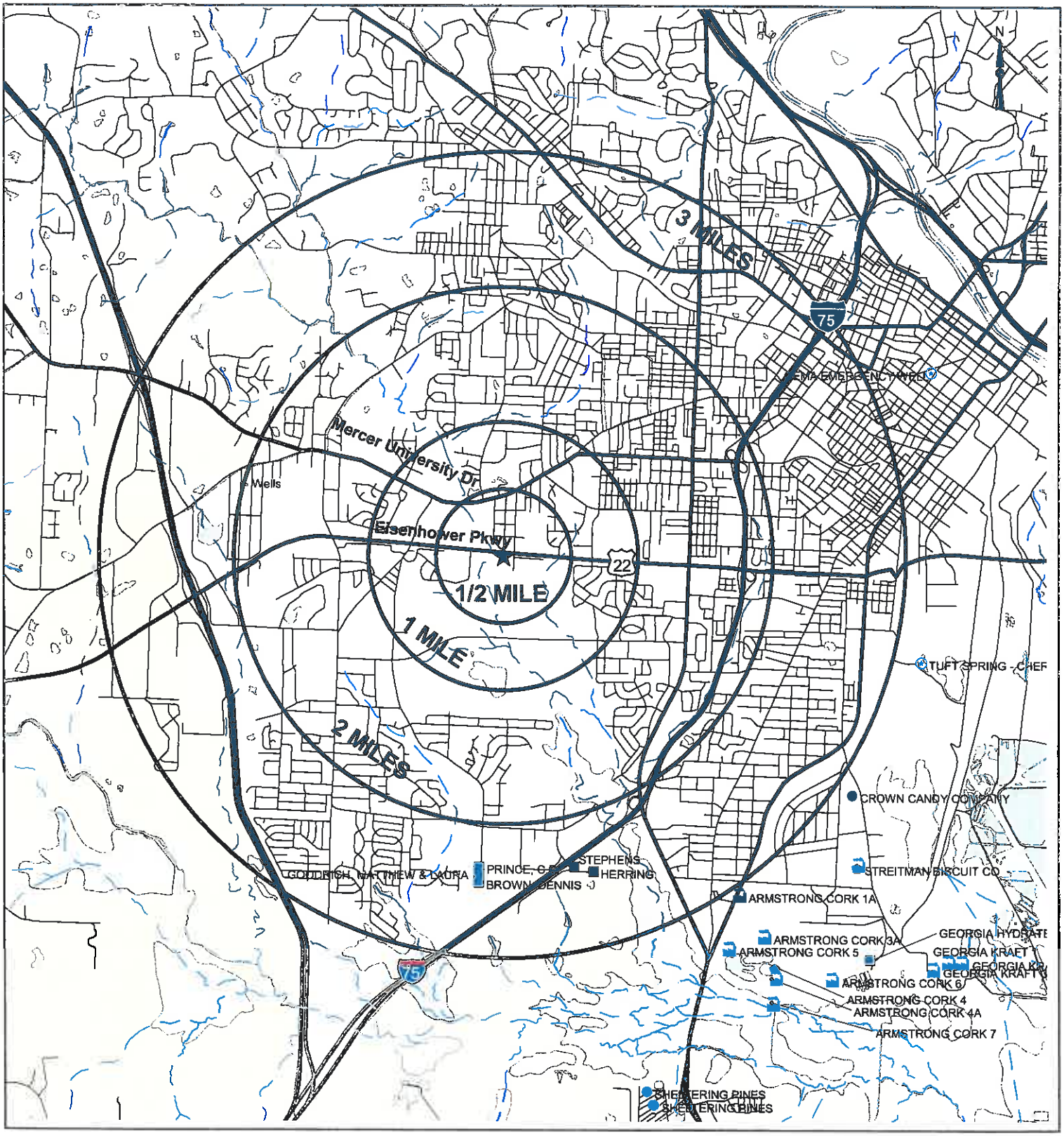
Drinking Water
HOUSEHOLD

Amerson Properties LTD
3855 Melrose Street
Macon, Bibb County

Scale: 1 inch = 1 mile
32 51' 07" 83 41' 09"

Sources: Wells from USGS GWSI (1999); EPD WRB Non-Municipal Wells (1997); EPD HWMB field surveys (1999); Surface Water Intakes from EPD GSB DR96-27(1996); Roads, Rivers, Wetlands from Georgia DOT (1993); Census data from U.S. Bureau of Census (1990)

4/21/03



Roads
State and US Highways
Interstate Highways
Rivers/Streams
Lake/Pond
Swamp/Marsh
Census Block Group Boundaries
Census Block Group with >zero domestic well

Public Supply
INDUSTRIAL
Drinking Water
Household
Commercial

Butler Max
2122 Eisenhower Parkway
Macon, Bibb County, Georgia

Scale: 1 inch = 1 mile
32 48' 54" 83 41' 13"

Sources: Wells from USGS GWSI (1999); EPD WRB Non-Municipal Wells (1997); EPD HWMB field surveys (2004); Surface Water Intakes from EPD GSB DR96-27(1996); Roads, Rivers, Wetlands from Georgia DOT (2000); Census data from U.S. Bureau of Census (1990)

02/28/11

Roads
State and US Highways
Interstate Highways
Rivers/Streams
Lake/Pond
Swamp/Marsh
Census Block Group Boundaries
Census Block Group with >zero domestic well

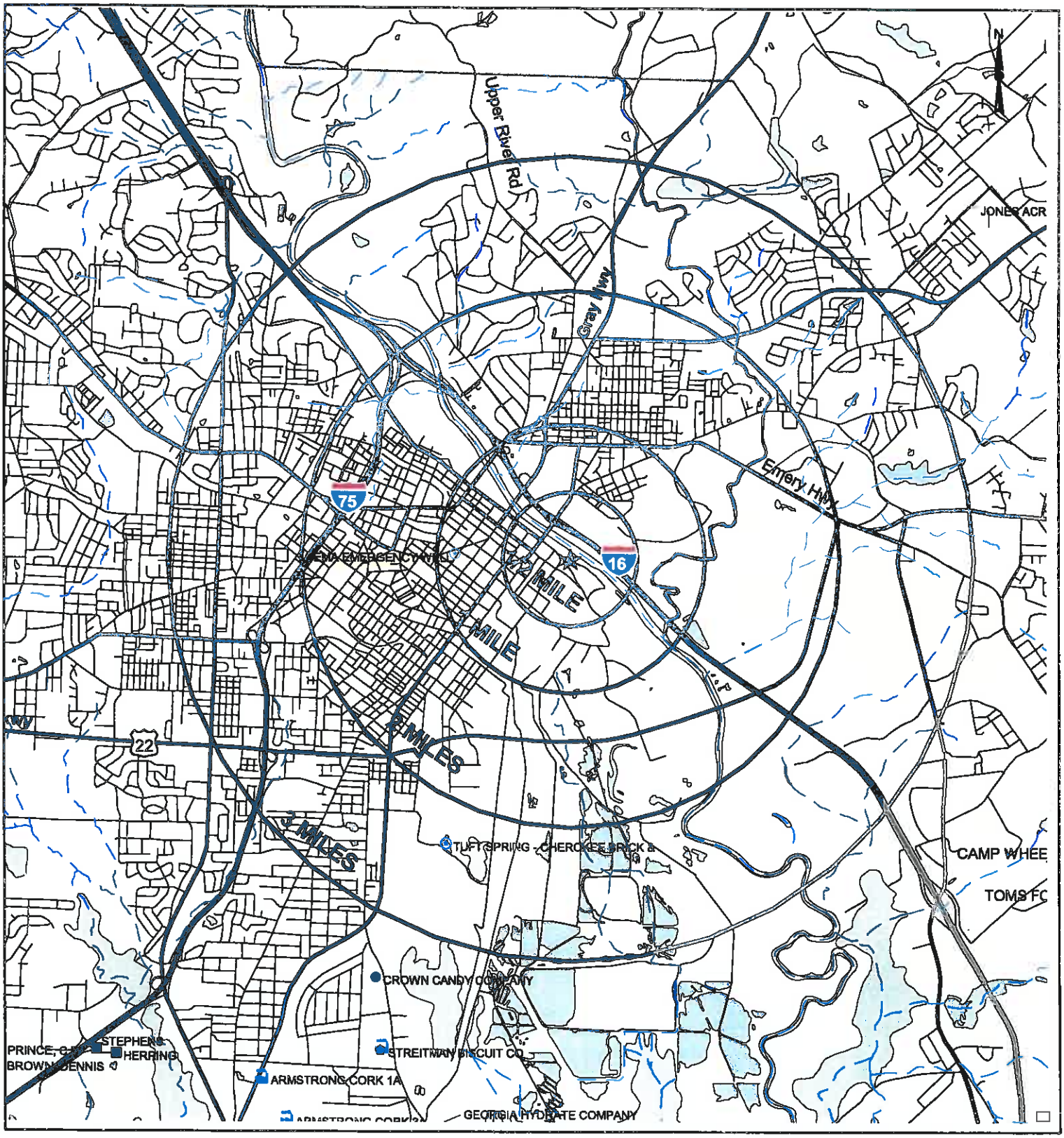
HOUSEHOLD
PUBLIC SUPPLY
INDUSTRIAL
UNUSED

Bibb Mill Properties (Former)
155 Coliseum Drive & 201 Coliseum Drive
Macon, Bibb County, Georgia

Scale: 1 inch = 1 mile
32 50 26 83 37' 02

Sources: Wells from USGS GWSI (1999); EPD WRB Non-Municipal Wells (1997); EPD HWMB field surveys (2004); Surface Water Intakes from EPD GSB DR96-27(1996); Roads, Rivers, Wetlands from Georgia DOT (2000); Census data from U.S. Bureau of Census (1990)

9/15/17



- Roads
- State and US Highways
- Interstate Highways
- Rivers/Streams
- Lake/Pond
- Swamp/Marsh
- Census Block Group Boundaries
- Census Block Group with >zero domestic well

- *Drinking Water*
- *Household*
- *Drinking Water*
- *INDUSTRIAL*

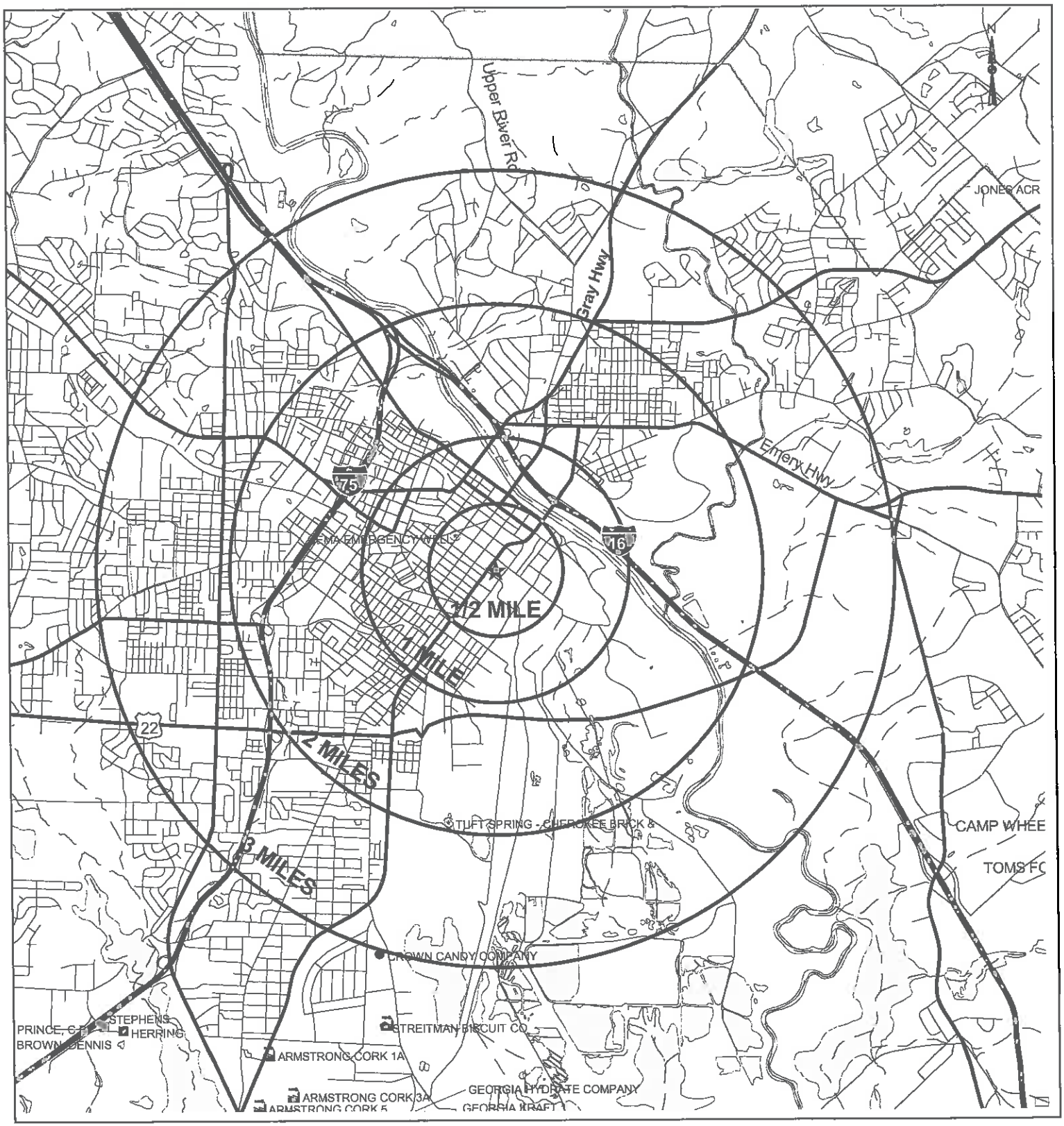
Caduceus Property (Former)
167 Riverside Drive
Macon, Bibb County

Scale: 1 inch = 1 mile

32 50' 09" 83 37' 01"

Sources: Wells from USGS GWSI (1999); EPD WRB Non-Municipal Wells (1997); EPD HWMB field surveys (2004); Surface Water Intakes from EPD GSB DR96-27(1996); Roads, Rivers, Wetlands from Georgia DOT (2000); Census data from U.S. Bureau of Census (1990)

02/21/2007



Roads
State and US Highways
Interstate Highways
Rivers/Streams
Lake/Pond
Swamp/Marsh
Census Block Group Boundaries
Census Block Group with >zero domestic well

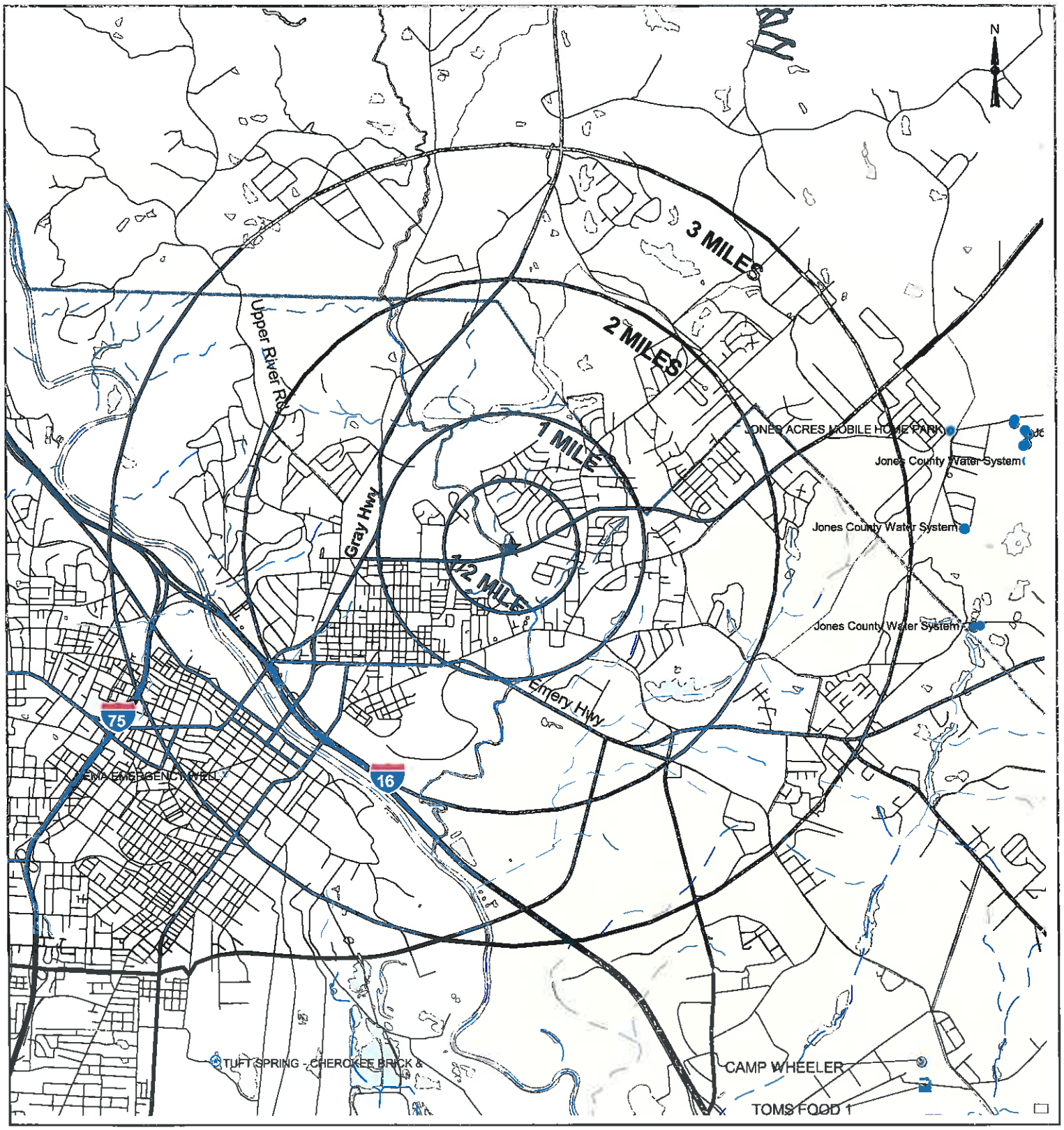
Public Supply
INDUSTRIAL
Drinking Water
Household
Commercial

Capricorn Center
560 MLK Jr. Boulevard
Macon, Bibb County, Georgia

Scale: 1 inch = 1 mile
32 49' 55" 83 37' 37"

Sources: Wells from USGS GWSI (1999); EPD WRB Non-Municipal Wells (1997); EPD HWMB field surveys (2004); Surface Water Intakes from EPD GSB DR96-27(1996); Roads, Rivers, Wetlands from Georgia DOT (2000); Census data from U.S. Bureau of Census (1990)

08/17/12



Roads
State and US Highways
Interstate Highways
Rivers/Streams
Lake/Pond
Swamp/Marsh
Census Block Group Boundaries
Census Block Group with >zero domestic well

Drinking Water
INDUSTRIAL

Childrens's Sesame
2750 Walnut Creek Road
Macon, Bibb County

Scale: 1 inch = 1 mile
32 51' 39" 83 35' 45"

Sources: Wells from USGS GWSI (1999); EPD WRB Non-Municipal Wells (1997); EPD HWMB field surveys (2004); Surface Water Intakes from EPD GSB DR96-27(1996); Roads, Rivers, Wetlands from Georgia DOT (2000); Census data from U.S. Bureau of Census (1990)

01/07/08

Roads
State and US Highways
Interstate Highways
Rivers/Streams
Lake/Pond
Swamp/Marsh
Census Block Group Boundaries
Census Block Group with >zero domestic well

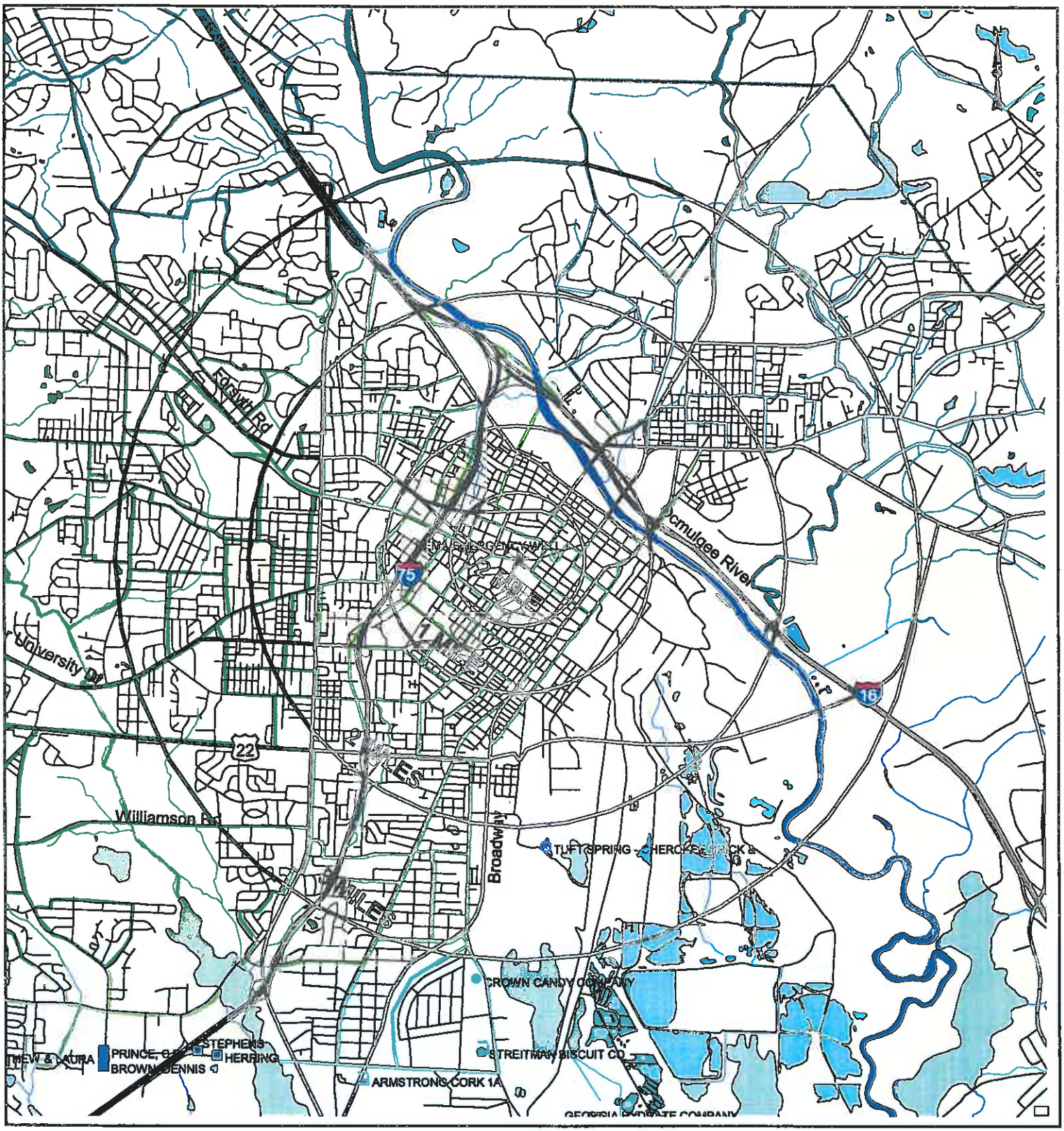
Public Supply
INDUSTRIAL
Drinking Water
Household
Commercial

Citgo Food Mart
1924 Hardeman Avenue
Macon, Bibb County, Georgia

Scale: 1 inch = 1 mile
32 50 27" 83 38' 56"

Sources: Wells from USGS GWSI (1999); EPD WRB Non-Municipal Wells (1997); EPD HWMB field surveys (2004); Surface Water Intakes from EPD GSB DR96-27(1996); Roads, Rivers, Wetlands from Georgia DOT (2000); Census data from U.S. Bureau of Census (1990)

01/15/13



Roads
State and US Highways
Interstate Highways
Rivers/Streams
Lake/Pond
Swamp/Marsh
Census Block Group Boundaries
Census Block Group with >zero domestic well

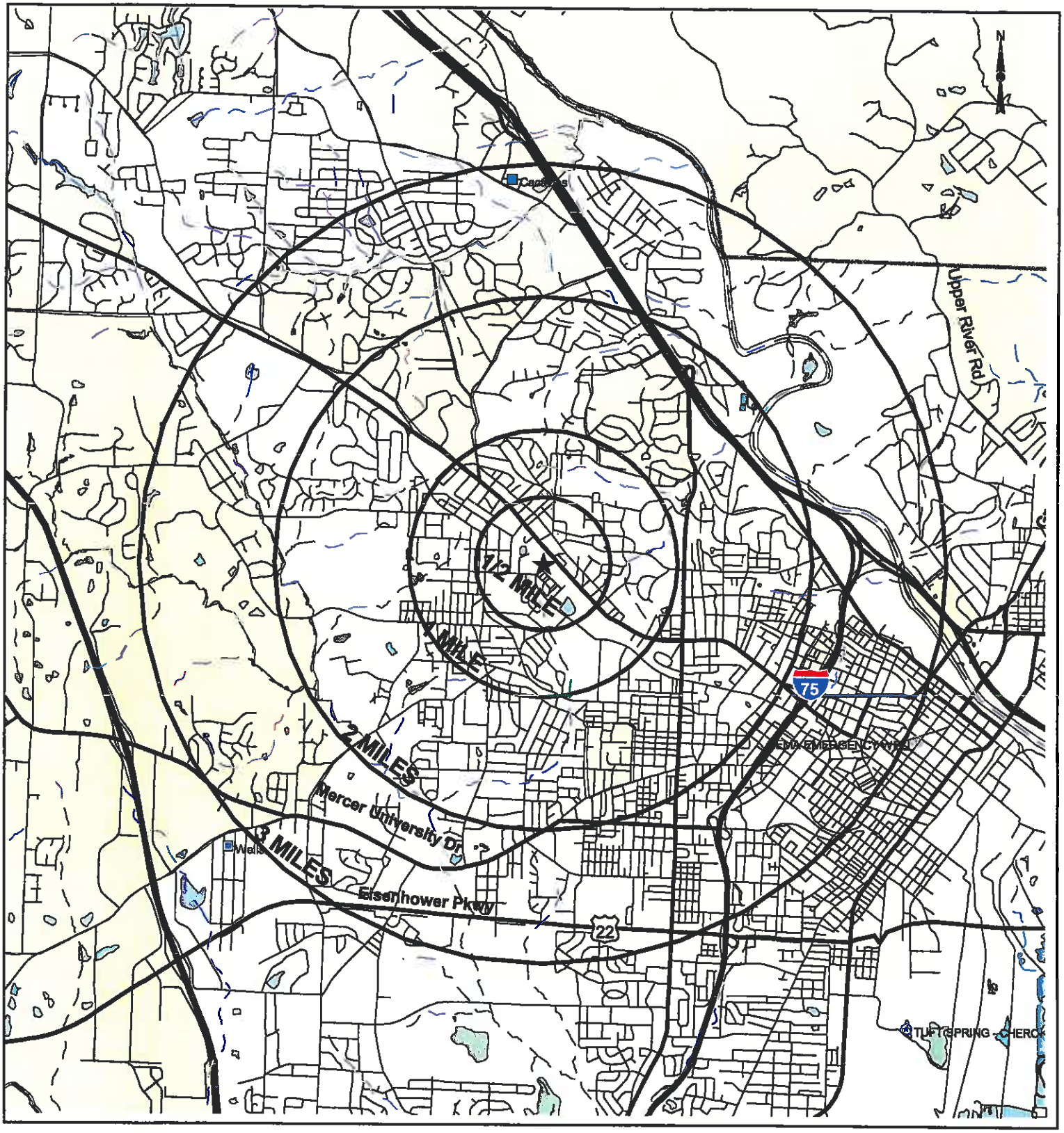
PUBLIC SUPPLY
Drinking Water
HOUSEHOLD
INDUSTRIAL

Dennard Sinclair Service Station
681 Spring Street
Macon, Bibb County

Scale: 1 inch = 1 mile
32 50' 09" 83 38' 13"

Sources: Wells from USGS GWSI (1999); EPD WRB Non-Municipal Wells (1997); EPD HWMB field surveys (1999); Surface Water Intakes from EPD GSB DR96-27(1998); Roads, Rivers, Wetlands from Georgia DOT (1993); Census data from U.S. Bureau of Census (1990)

12/16/2002

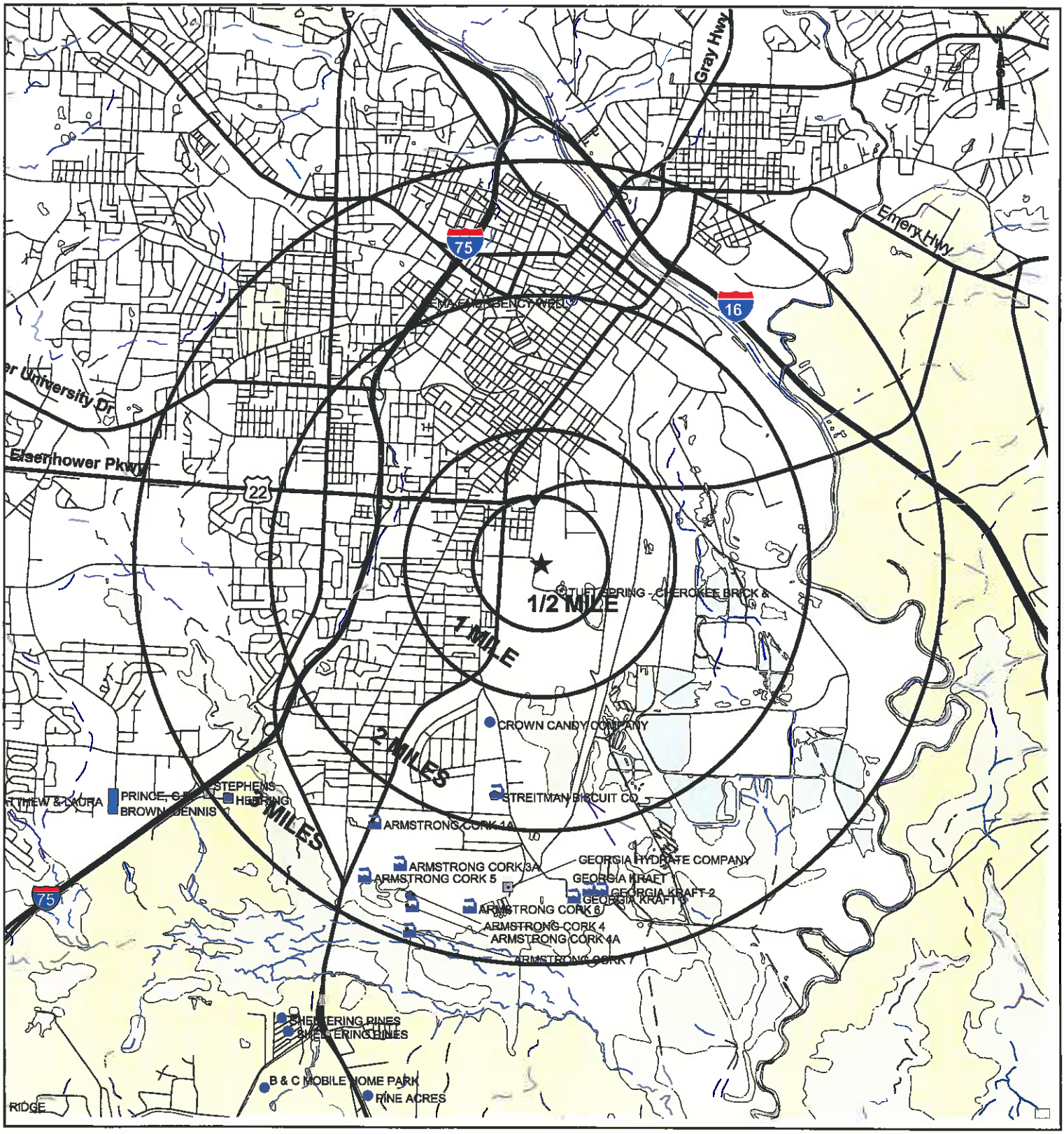


Gem Cleaners
3330 Vineville Avenue
Macon, Bibb County

Scale: 1 inch = 1 mile
32 51' 14" 83 40' 48"

Sources: Wells from USGS GWSI (1999); EPD WRB Non-Municipal Wells (1997); EPD HWMB field surveys (2004); Surface Water Intakes from EPD GSB DR96-27(1996); Roads, Rivers, Wetlands from Georgia DOT (2000); Census data from U.S. Bureau of Census (1990)

11/16/06



Roads
State and US Highways
Interstate Highways
Rivers/Streams
Lake/Pond
Swamp/Marsh
Census Block Group Boundaries
Census Block Group with >zero domestic well

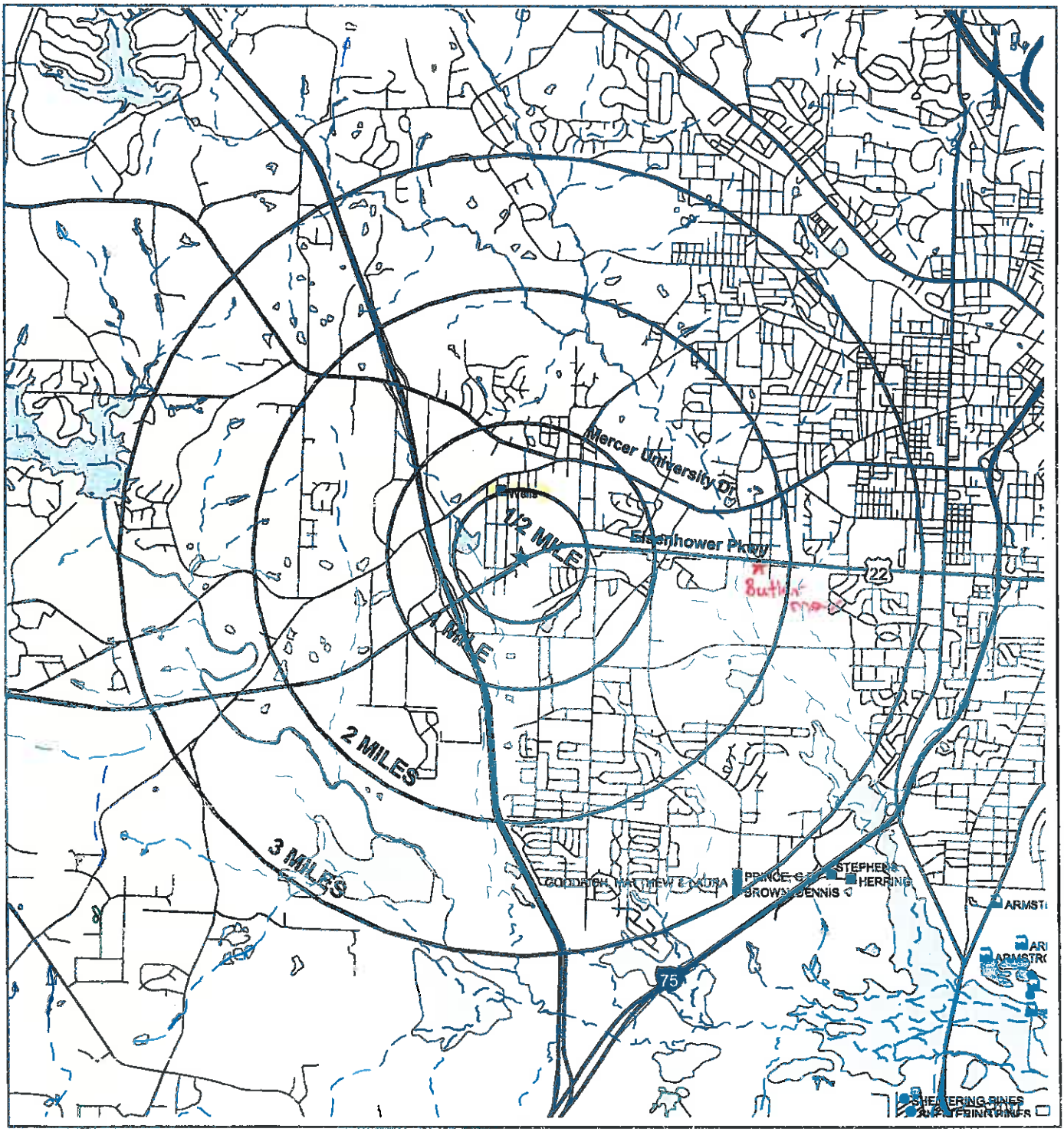
Public Supply
INDUSTRIAL
Drinking Water
Household
Commercial

Greenleaf Treatment Services
100 Waste Research Drive
Macon, Bibb County, Georgia

Scale: 1 inch = 1 mile
32 48' 25" 83 38' 06"

Sources: Wells from USGS GWSI (1999); EPD WRB Non-Municipal Wells (1997); EPD HWMB field surveys (2004); Surface Water Intakes from EPD GSB DR96-27(1996); Roads, Rivers, Wetlands from Georgia DOT (2000); Census data from U.S. Bureau of Census (1990)

08/12/11



Roads
State and US Highways
Interstate Highways
Rivers/Streams
Lake/Pond
Swamp/Marsh
Census Block Group Boundaries
Census Block Group with >zero domestic well

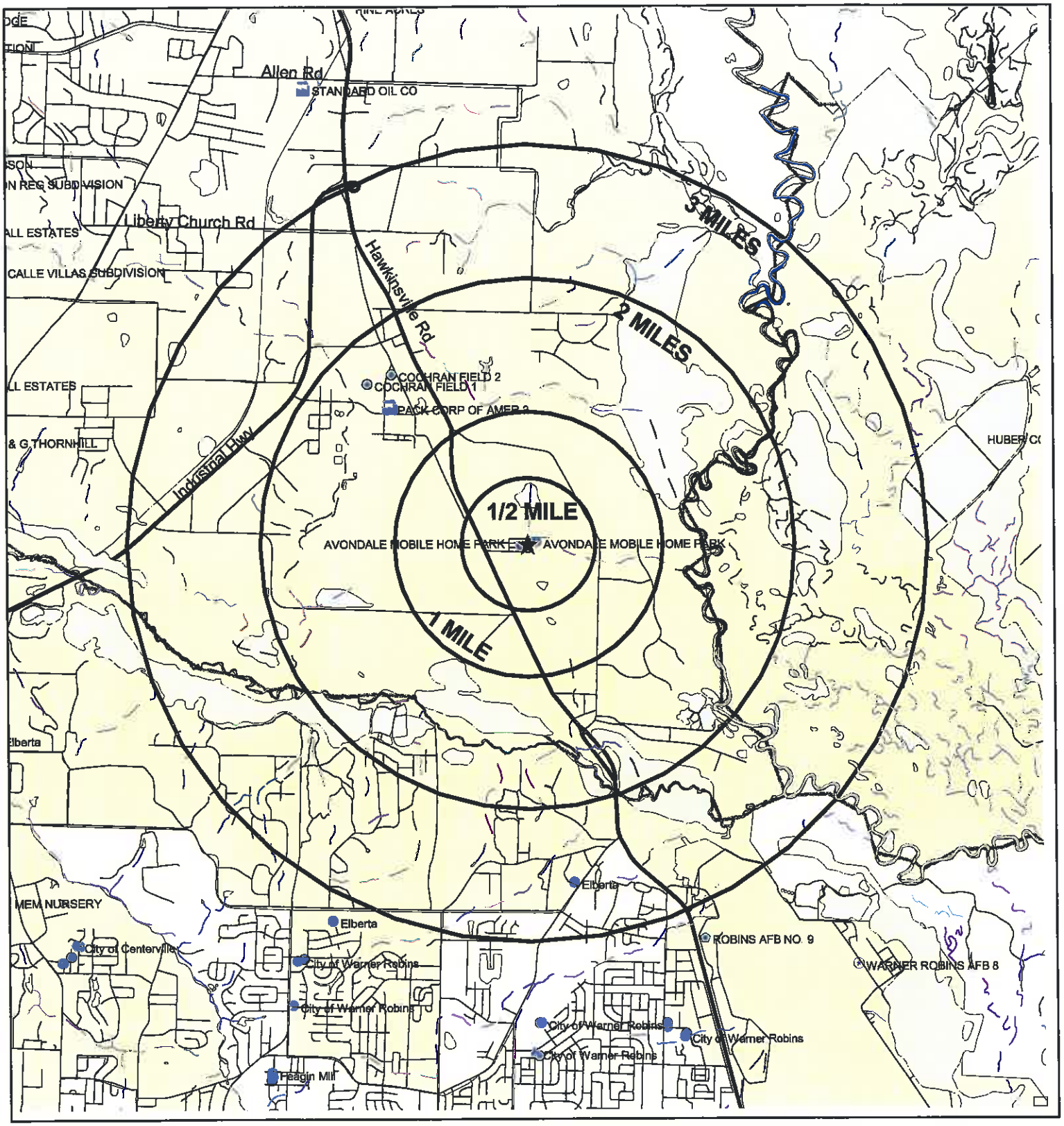
HOUSEHOLD
INDUSTRIAL
Public Supply

Judd Publishing
4863 Eisenhower Parkway
Macon, Bibb County

Scale: 1 inch = 1 mile
32 48' 54" 83 43' 01"

Sources: Wells from USGS GWSI (1999); EPD WRB Non-Municipal Wells (1997); EPD HWMB field surveys (2004); Surface Water Intakes from EPD GSB DR86-27(1986); Roads, Rivers, Wetlands from Georgia DOT (2000); Census data from U.S. Bureau of Census (1990)

10/27/04



Roads
State and US Highways
Interstate Highways
Rivers/Streams
Lake/Pond
Swamp/Marsh
Census Block Group Boundaries
Census Block Group with >zero domestic well

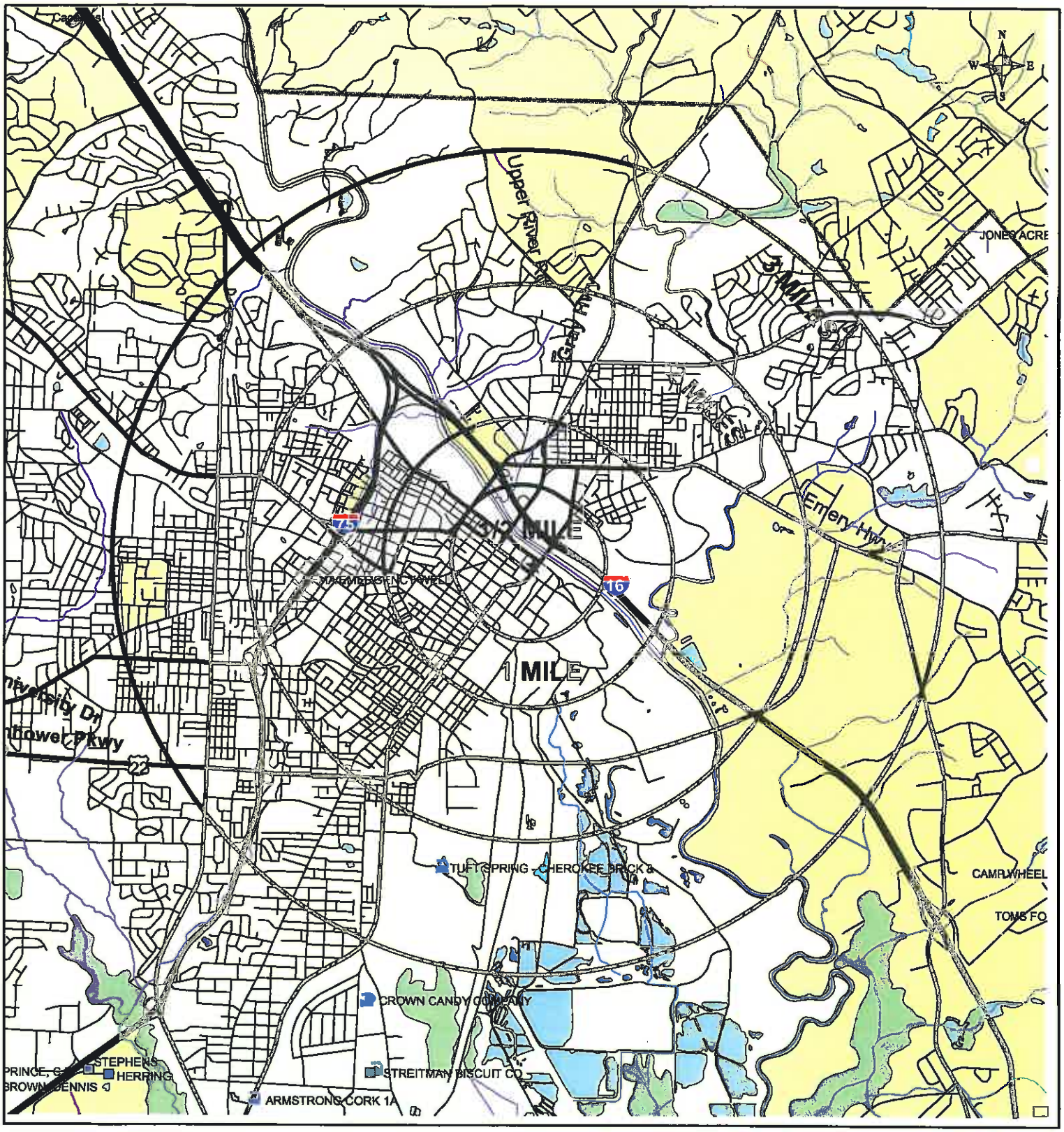
Public Supply
INDUSTRIAL
Drinking Water

Lamar Reene Property
9045 Feagin Road
Macon, Bibb County, Georgia

Scale: 1 inch = 1 mile
32 41' 27" 83 37' 51"

Sources: Wells from USGS GWSI (1999); EPD WRB Non-Municipal Wells (1997); EPD HWMB field surveys (2004); Surface Water Intakes from EPD GSB DR96-27(1996); Roads, Rivers, Wetlands from Georgia DOT (2000); Census data from U.S. Bureau of Census (1990)

01/26/09



Roads
State and US Highways
Interstate Highways
Rivers/Streams
Lake/Pond
Swamp/Marsh
Census Block Group Boundaries
Census Block Group with >zero domestic well

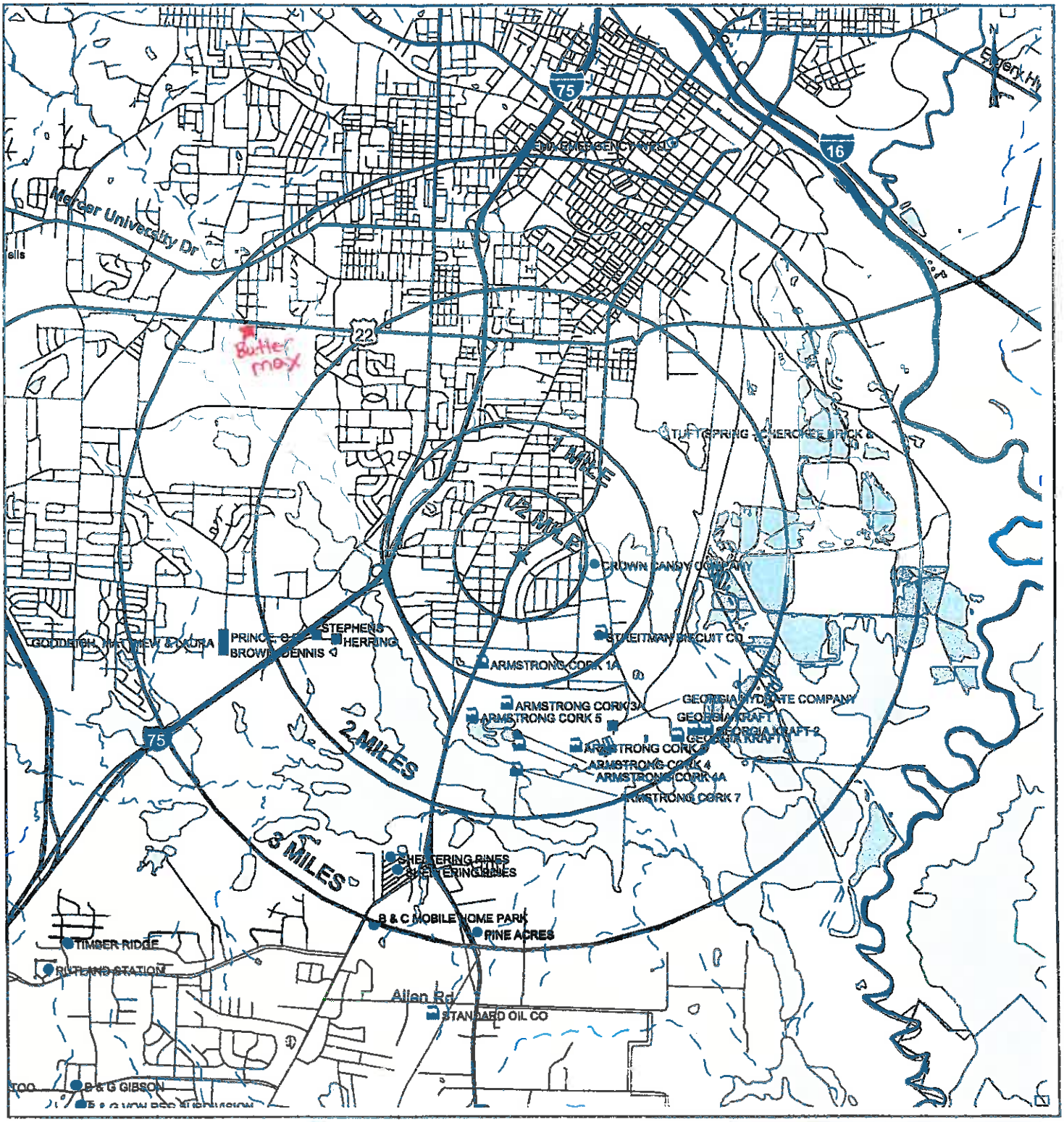
HOUSEHOLD
PUBLIC SUPPLY
INDUSTRIAL
UNUSED
DRINKING WATER

Macon Telegraph (Former)
120 & 139 Broadway
Macon, Bibb County, Georgia

Scale: 1 inch = 1 mile
32 48 15 83 37' 19

Sources: Wells from USGS GWSI (1999); EPD WRB Non-Municipal Wells (1997); EPD HWMB field surveys (2004); Surface Water Intakes from EPD GSB DR96-27(1996); Roads, Rivers, Wetlands from Georgia DOT (2000); Census data from U.S. Bureau of Census (1990)

7/27/17



Roads
State and US Highways
Interstate Highways
Rivers/Streams
Lake/Pond
Swamp/Marsh
Census Block Group Boundaries
Census Block Group with >zero domestic well

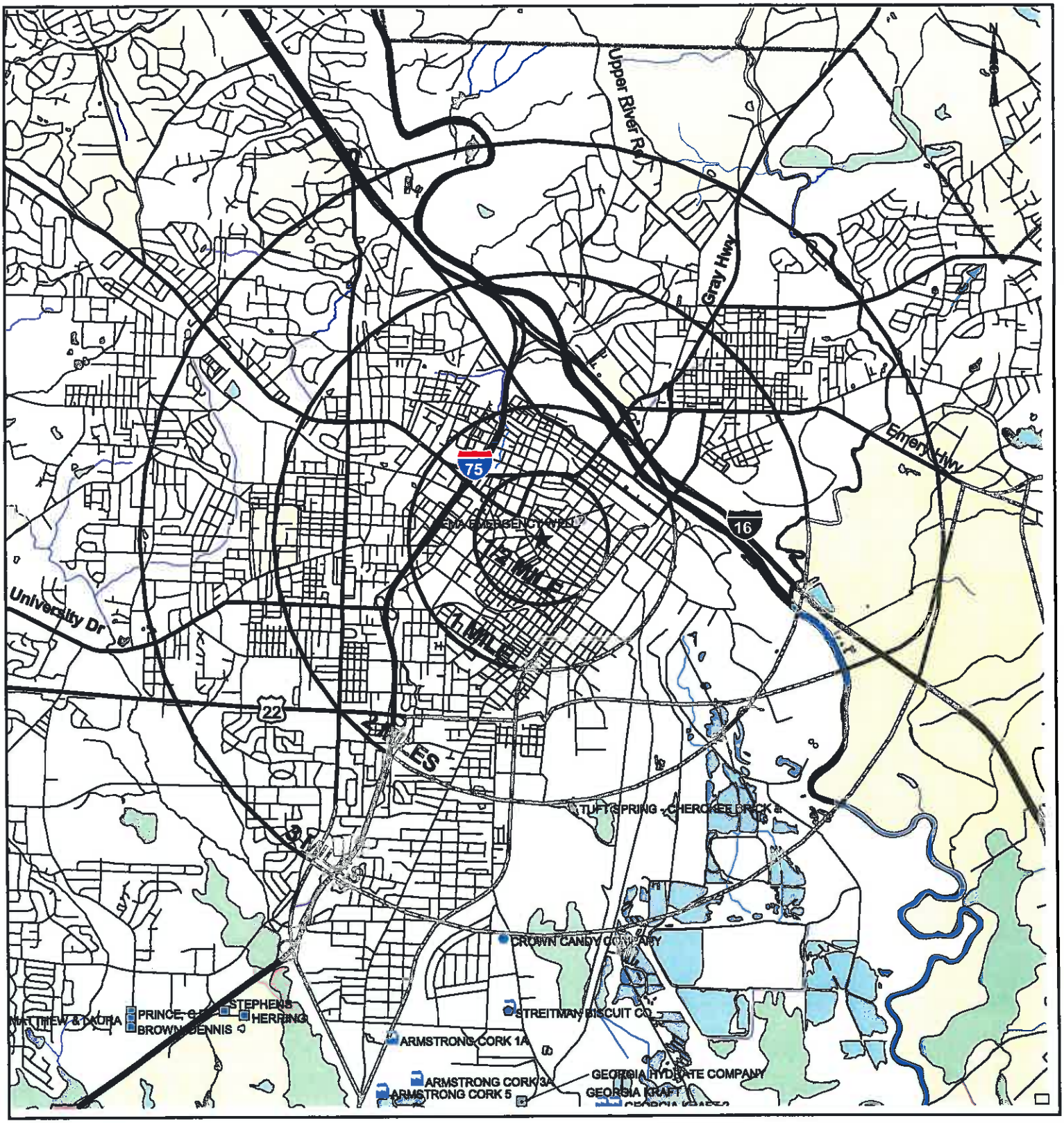
HOUSEHOLD
INDUSTRIAL
Public Supply
Commercial

McClain Property
860 Fulton Street
Macon, Bibb County

Scale: 1 inch = 1 mile
32 47' 27" 83 39' 03"

Sources: Wells from USGS GWSI (1999); EPD WRB Non-Municipal Wells (1997); EPD HWMB field surveys (1999); Surface Water Intakes from EPD GSB DRS6-27(1986); Roads, Rivers, Wetlands from Georgia DOT (1993); Census data from U.S. Bureau of Census (1990)

12/15/03



Roads
State and US Highways
Interstate Highways
Rivers/Streams
Lake/Pond
Swamp/Marsh
Census Block Group Boundaries
Census Block Group with >zero domestic well

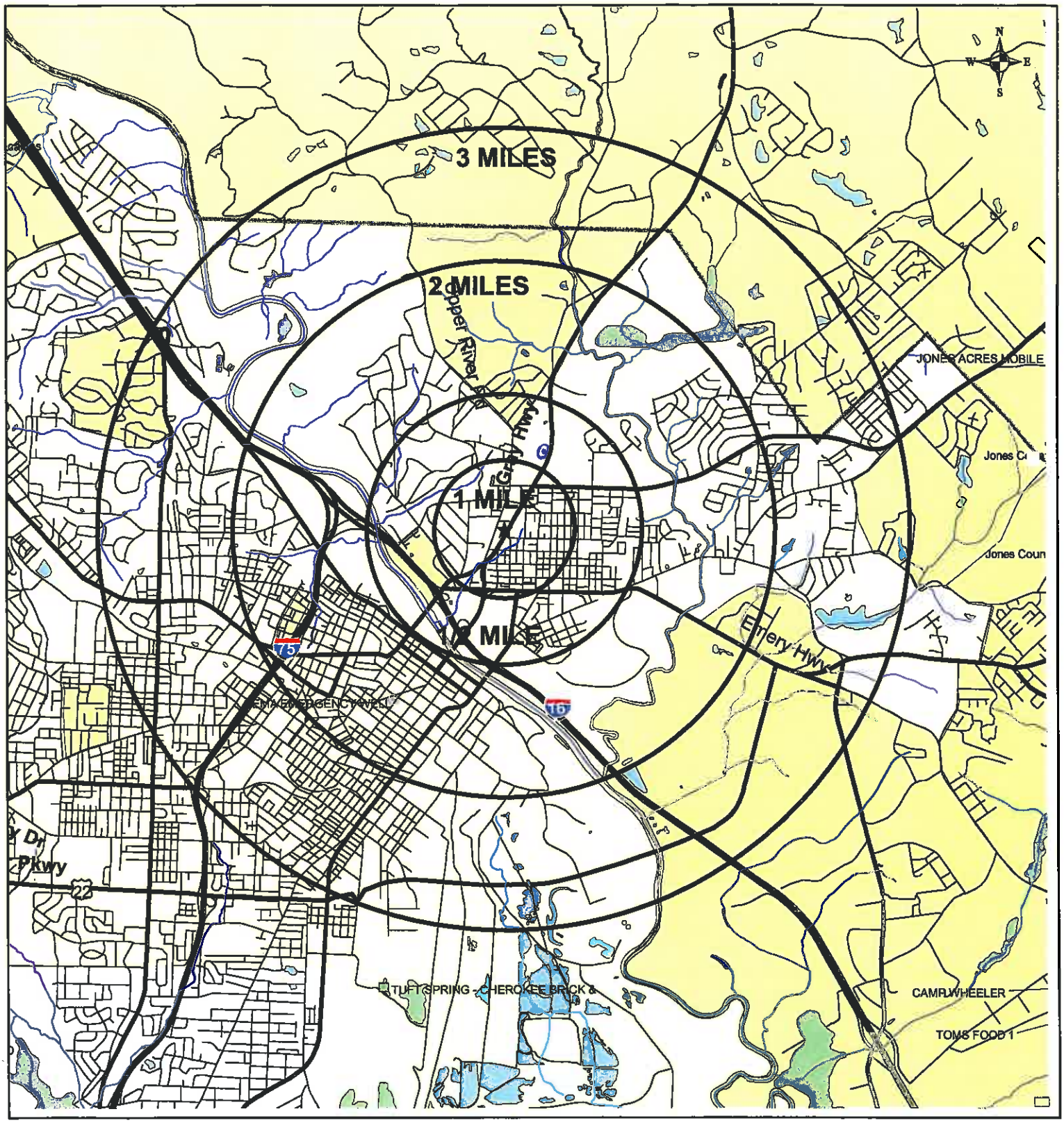
Drinking Water
HOUSEHOLD
INDUSTRIAL
Public Supply

Middle Georgia Hospital Site
818 Pine Street
Macon, Bibb County

Scale: 1 inch = 1 mile
32 50' 02" 83 38' 13"

Sources: Wells from USGS GWSI (1999); EPD WRB Non-Municipal Wells (1997); EPD HWMB field surveys (1999); Surface Water intakes from EPD GSB DR96-27(1996); Roads, Rivers, Wetlands from Georgia DOT (1993); Census data from U.S. Bureau of Census (1990)

05/28/03



Roads
State and US Highways
Interstate Highways
Rivers/Streams
Lake/Pond
Swamp/Marsh
Census Block Group Boundaries
Census Block Group with >zero domestic well

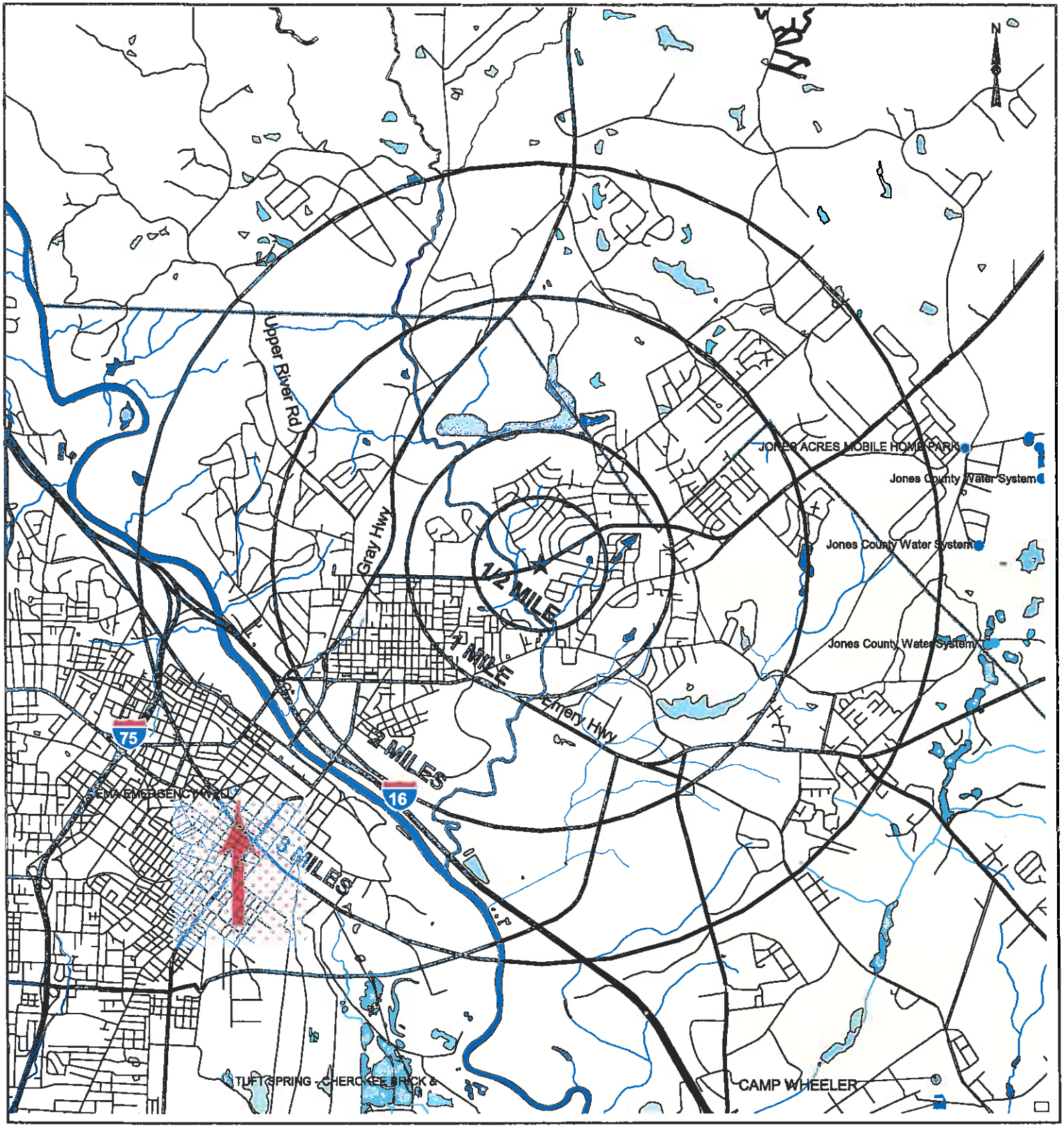
Unused
Drinking Water

One Hour Martinizing
1060 Grey Highway
Macon, Bibb County, Georgia

Scale: 1 inch = 1 mile
32 51 17 83 37' 06

Sources: Wells from USGS GWSI (1999); EPD WRB Non-Municipal Wells (1997); EPD HWMB field surveys (2004); Surface Water Intakes from EPD GSD DR93-27(1993); Roads, Rivers, Wetlands from Georgia DOT (2000); Census data from U.S. Bureau of Census (1990)

9/25/15



Roads
State and US Highways
Interstate Highways
Rivers/Streams
Lake/Pond
Swamp/Marsh
Census Block Group Boundaries
Census Block Group with >zero domestic well

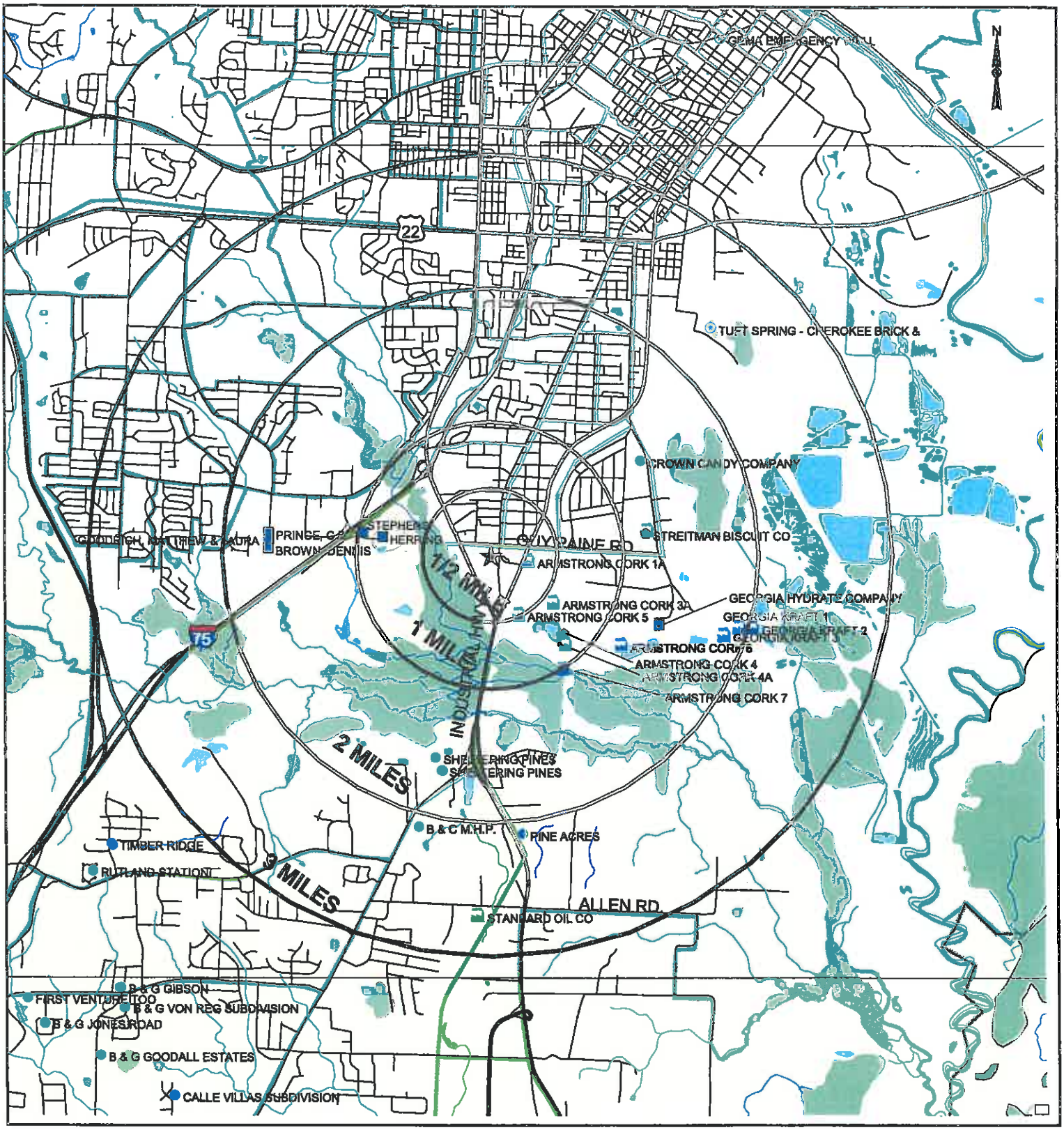
PUBLIC SUPPLY
Drinking Water
HOUSEHOLD
INDUSTRIAL

Parker Automotive
1878 Shurling Drive
Macon, Bibb County

Scale: 1 inch = 1 mile
32 51' 39" 83 15' 38"

Sources: Wells from USGS GWSI (1999); EPD WRB Non-Municipal Wells (1997); EPD HWMB field surveys (1999); Surface Water Intakes from EPD GSB DR96-27(1996); Roads, Rivers, Wetlands from Georgia DOT (1993); Census data from U.S. Bureau of Census (1990)

3/13/03



Roads
State and US Highways
Interstate Highways
Rivers/Streams
Lake/Pond
Swamp/Marsh
Census Block Group Boundaries
Census Block Group with >zero domestic well

PUBLIC SUPPLY
Drinking Water
HOUSEHOLD
INDUSTRIAL

Pepsi Cola Bottling
4541 Houston Avenue
Macon, Bibb County

Scale: 1 inch = 1 mile
32 46' 44" 83 39' 36"

Sources: Wells from USGS GWSI (1999); EPD WRB Non-Municipal Wells (1997); EPD HWMB field surveys (1999); Surface Water Intakes from EPD GSB DR96-27(1996); Roads, Rivers, Wetlands from Georgia DOT (1993); Census data from U.S. Bureau of Census (1990)

4/16/02

Roads
State and US Highways
Interstate Highways
Rivers/Streams
Lake/Pond
Swamp/Marsh
Census Block Group Boundaries
Census Block Group with >zero domestic well

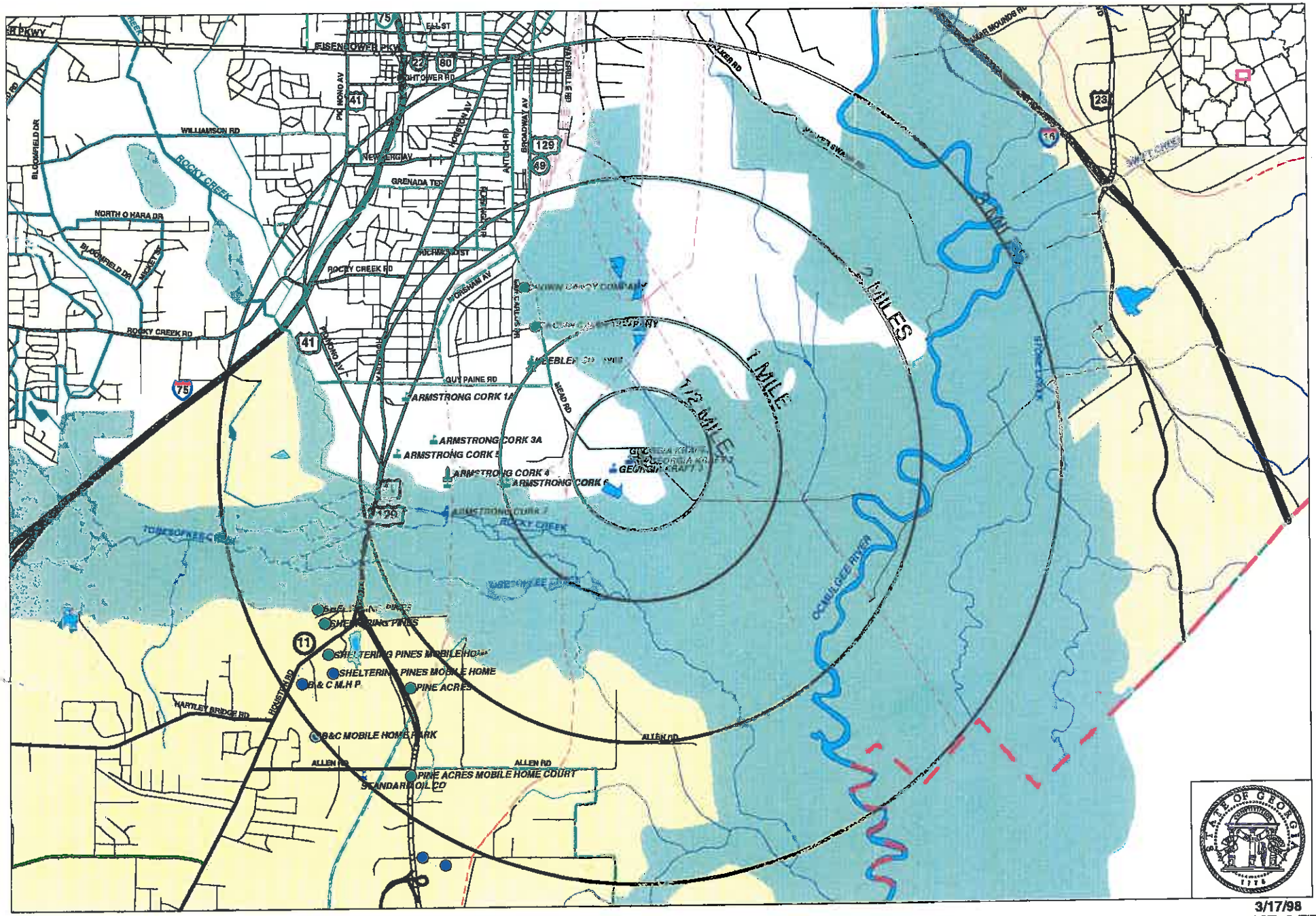
Public Supply
INDUSTRIAL
Drinking Water
Household
Commercial

Riverside Tire (Former)
852 Riverside Drive
Macon, Bibb County, Georgia

Scale: 1 inch = 1 mile
32 50 34" 83 37' 44"

Sources: Wells from USGS GWSI (1999); EPD WRB Non-Municipal Wells (1997); EPD HWMB field surveys (2004); Surface Water Intakes from EPD GSB DR96-27(1996); Roads, Rivers, Wetlands from Georgia DOT (2000); Census data from U.S. Bureau of Census (1990)

08/02/13



3/17/98

RIVERWOOD INTL GEORGIA (FORMER MACON KRAFT)
100 RIVERWOOD INTERNATIONAL WAY
MACON, BIBB COUNTY

1/2, 1, 2 and 3 MILE RADII Well Locations

32 46' 19" LAT / 83 37' 38" LONG

Census Block Group with >zero non-public supply well
Census Block Group served by public water
Public Supply Well
Surface Water Intake
Domestic Well
Unused Well
Spring
Industrial Well
Commercial Well
Irrigation Well
Livestock well
Well - Unknown use
Other Well
County Boundary
Road
Major Highway
Stream/River
Railroad
Wetland

SOURCES: Georgia Public Water Source Inventory, 1994; US Census Bureau 1990; Ga. Water Source Inv., USGS, 1995

Roads
State and US Highways
Interstate Highways
Rivers/Streams
Lake/Pond
Swamp/Marsh
Census Block Group Boundaries
Census Block Group with >zero domestic well

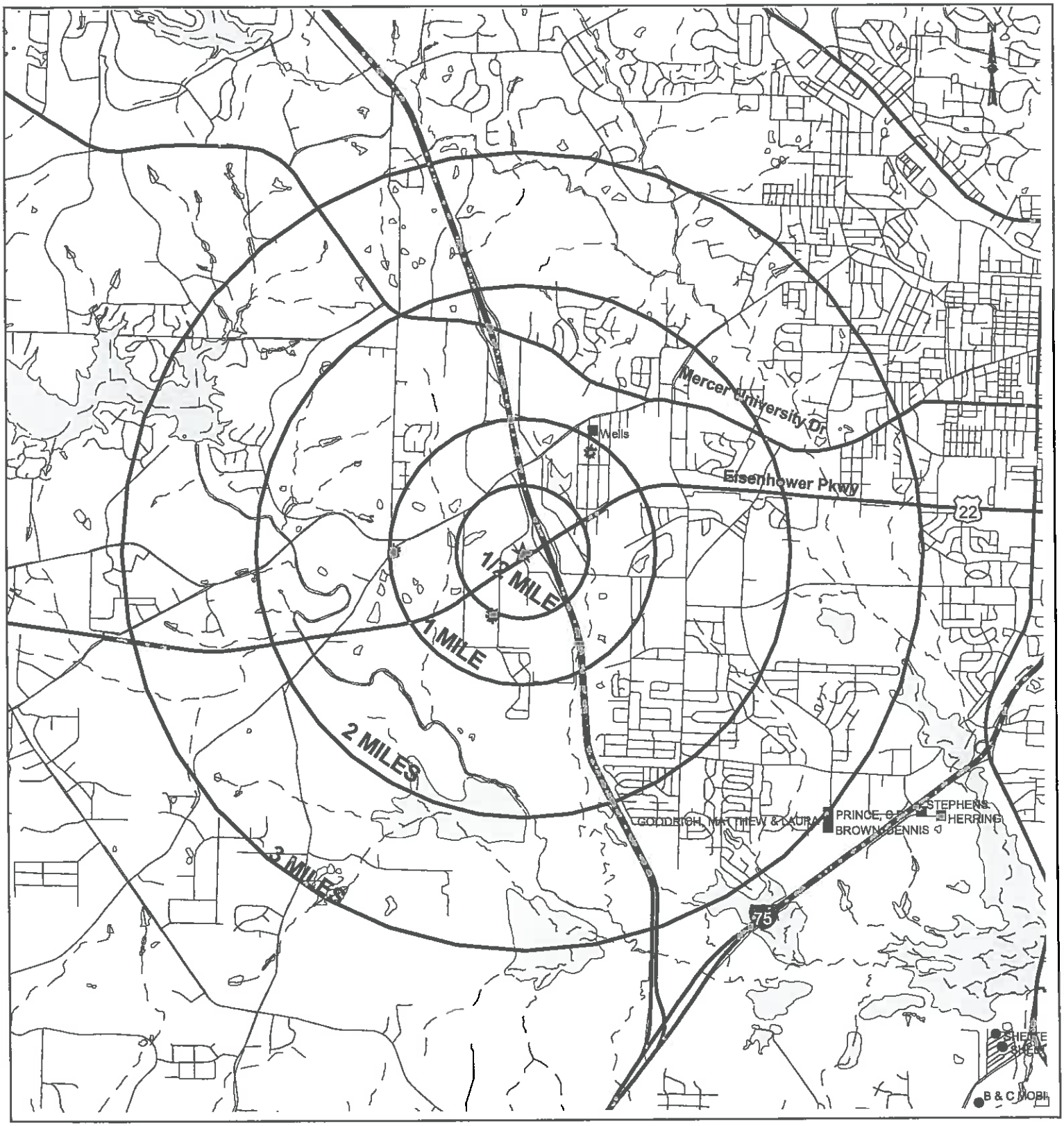
Drinking Water

Spectrum # 76
15 Spring Street
Macon, Bibb County

Scale: 1 inch = 1 mile
32 44' 34" 83 37' 48"

Sources: Wells from USGS GWSI (1999); EPD WRB Non-Municipal Wells (1997); EPD HWMB field surveys (2004); Surface Water Intakes from EPD GSB DR96-27(1996); Roads, Rivers, Wetlands from Georgia DOT (2000); Census data from U.S. Bureau of Census (1990)

06/30/06



Roads
State and US Highways
Interstate Highways
Rivers/Streams
Lake/Pond
Swamp/Marsh
Census Block Group Boundaries
Census Block Group with >zero domestic well

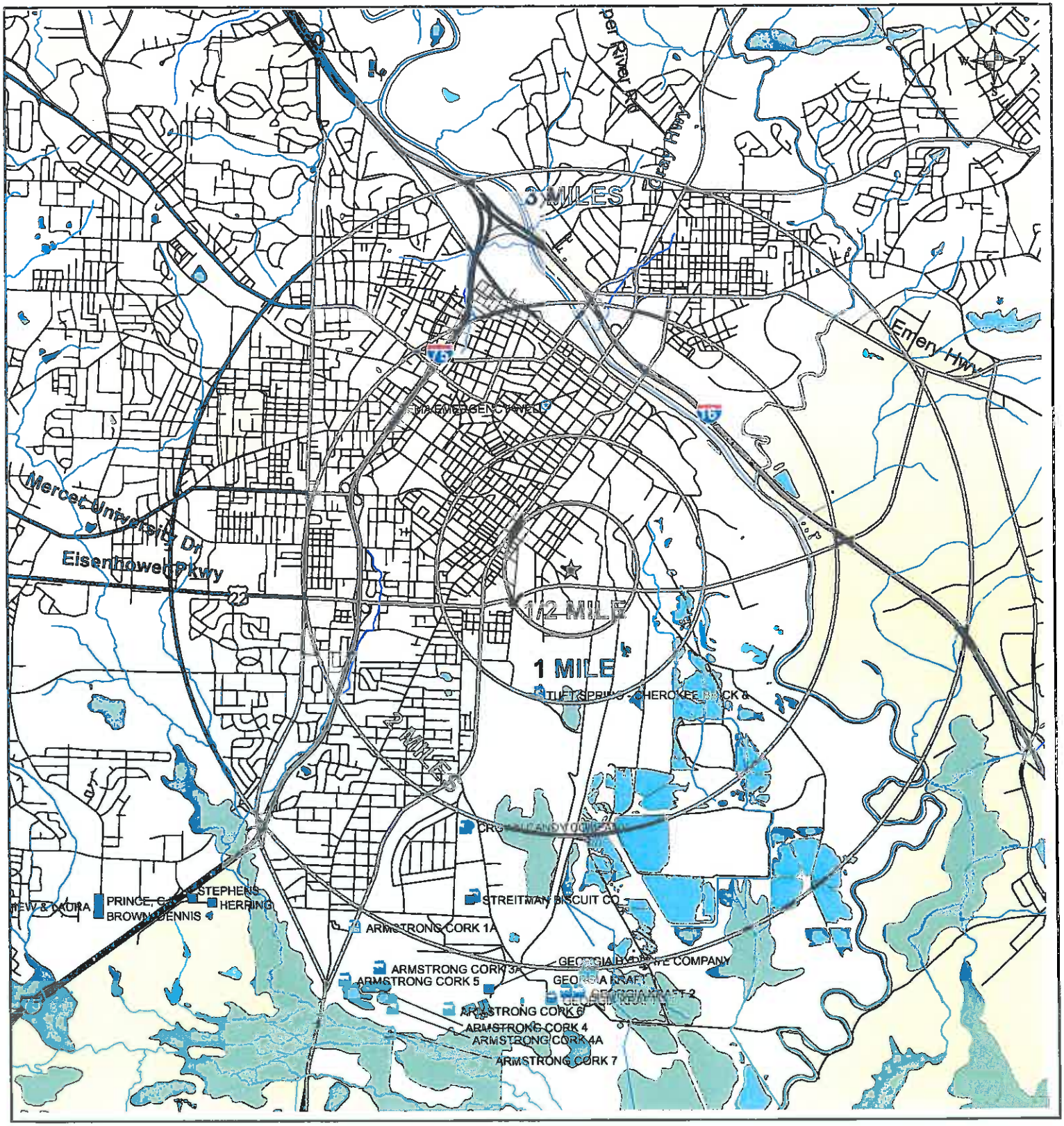
HOUSEHOLD
CONFIRMED DRINKING WATER WELLS

Spectrum # 94
5011 Romeiser Road
Macon, Bibb County

Scale: 1 inch = 1 mile
32 48' 32" 83 43' 44"

Sources: Wells from USGS GWSI (1999); EPD WRB Non-Municipal Wells (1997); EPD HWMB field surveys (2004); Surface Water Intakes from EPD GSB DR96-27(1996); Roads, Rivers, Wetlands from Georgia DOT (2000); Census data from U.S. Bureau of Census (1990)

06/30/06



Roads
State and US Highways
Interstate Highways
Rivers/Streams
Lake/Pond
Swamp/Marsh
Census Block Group Boundaries
Census Block Group with >zero domestic well

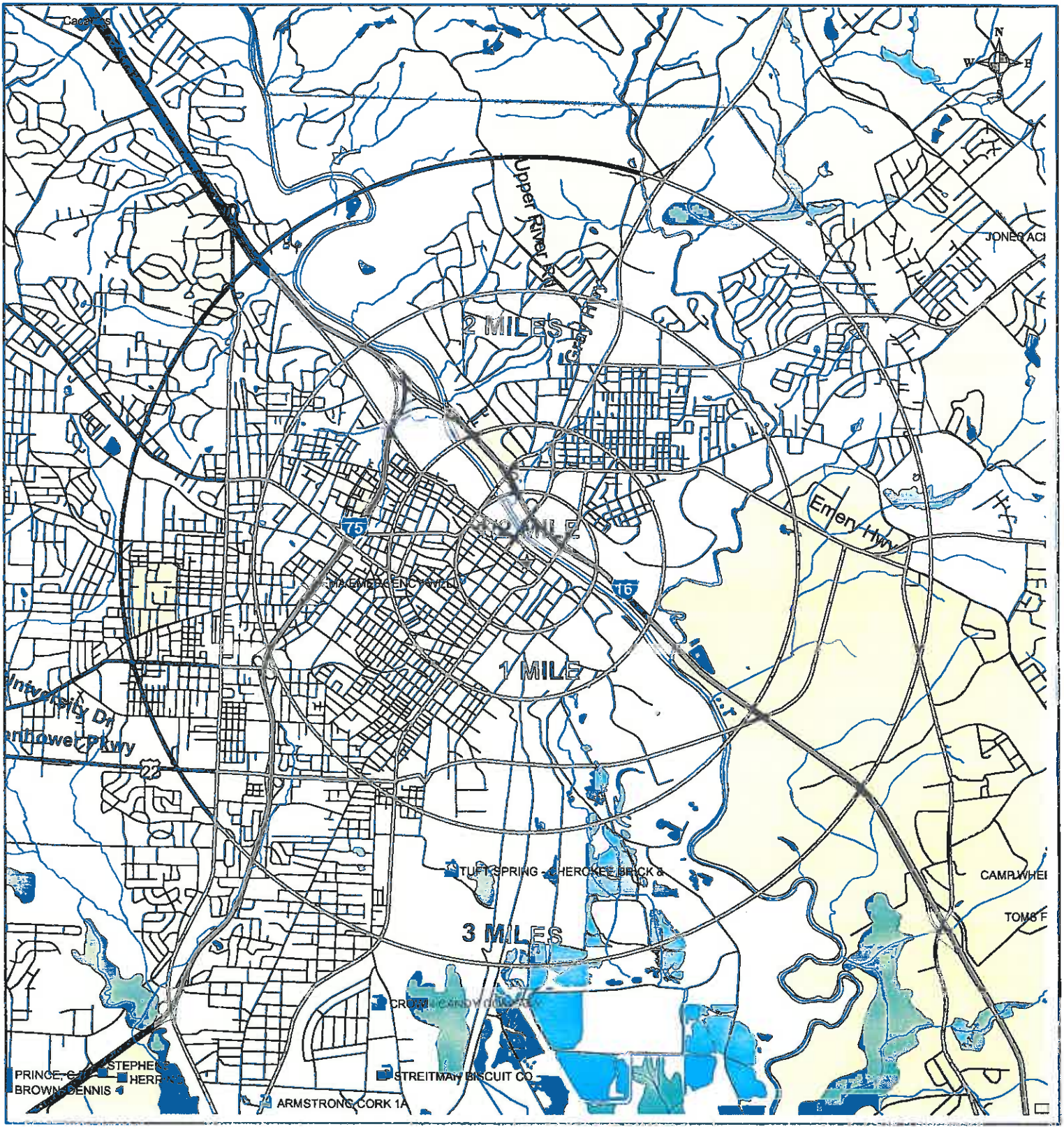
HOUSEHOLD
PUBLIC SUPPLY
INDUSTRIAL
UNUSED

Triangle Chemical Company
206 Lower Elm Street
Macon, Bibb County, Georgia

Scale: 1 inch = 1 mile
32 49 05 83 37' 43

Sources: Wells from USGS GWSI (1999); EPD WRB Non-Municipal Wells (1997); EPD HWMB field surveys (2004); Surface Water Intakes from EPD GSB DR96-27(1996); Roads, Rivers, Wetlands from Georgia DOT (2000); Census data from U.S. Bureau of Census (1990)

12/23/16



- Roads
- State and US Highways
- Interstate Highways
- Rivers/Streams
- Lake/Pond
- Swamp/Marsh
- Census Block Group Boundaries
- Census Block Group with >zero domestic well

- HOUSEHOLD
- PUBLIC SUPPLY
- INDUSTRIAL
- UNUSED

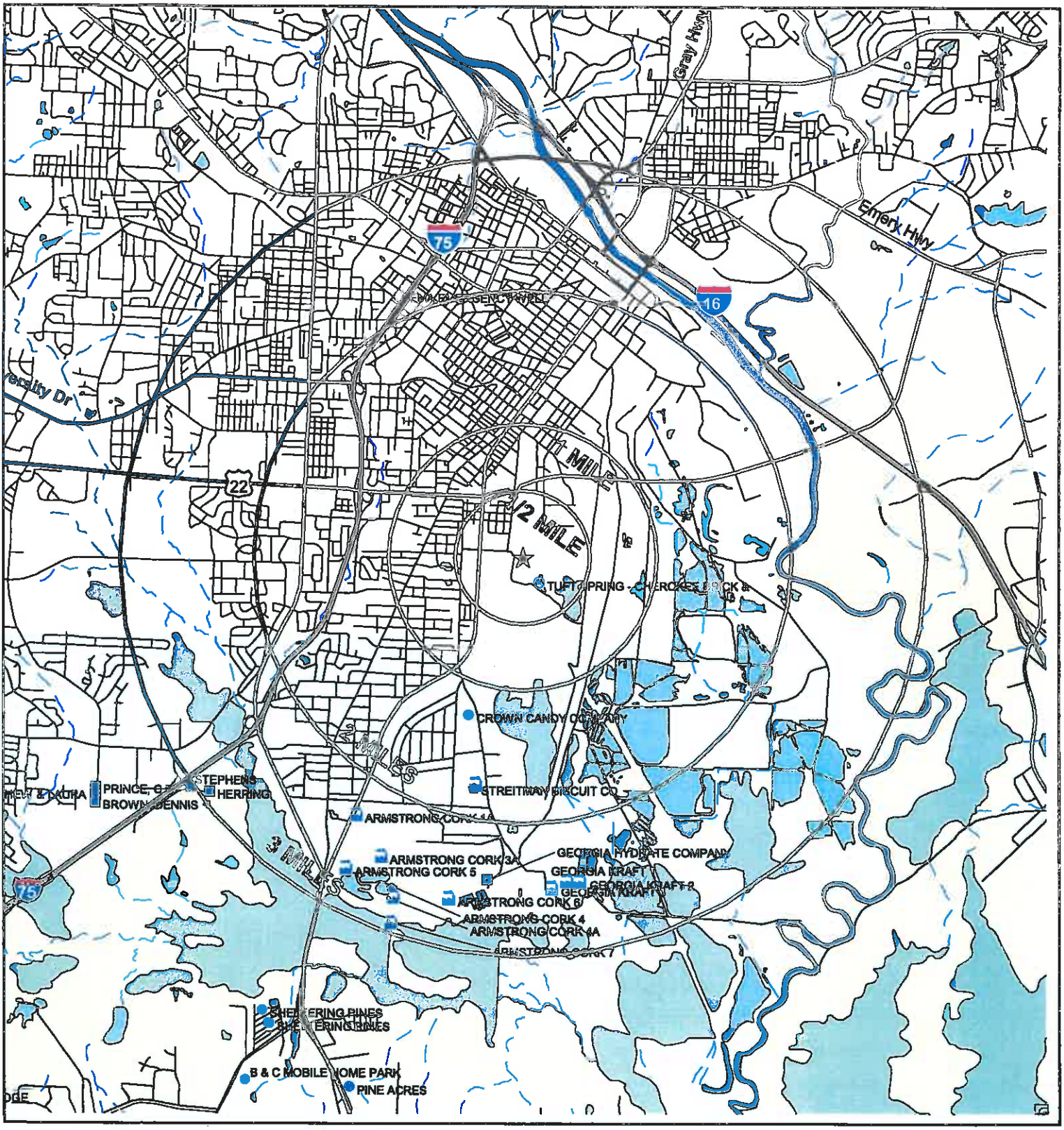
U.S. Probation Office
433 Walnut Street
Macon, Bibb County, Georgia

Scale: 1 inch = 1 mile

32 50 17 83 37' 26

Sources: Wells from USGS GWSI (1999); EPD WRB Non-Municipal Wells (1997); EPD HWMB field surveys (2004); Surface Water Intakes from EPD GSB DR96-27(1996); Roads, Rivers, Wetlands from Georgia DOT (2000); Census data from U.S. Bureau of Census (1990)

6/5/18



- Roads
- State and US Highways
- Interstate Highways
- Rivers/Streams
- Lake/Pond
- Swamp/Marsh
- Census Block Group Boundaries
- Census Block Group with >zero domestic well

- *HOUSEHOLD*
- *INDUSTRIAL*
- *Public Supply*
- *Commercial*
- *Drinking Water*

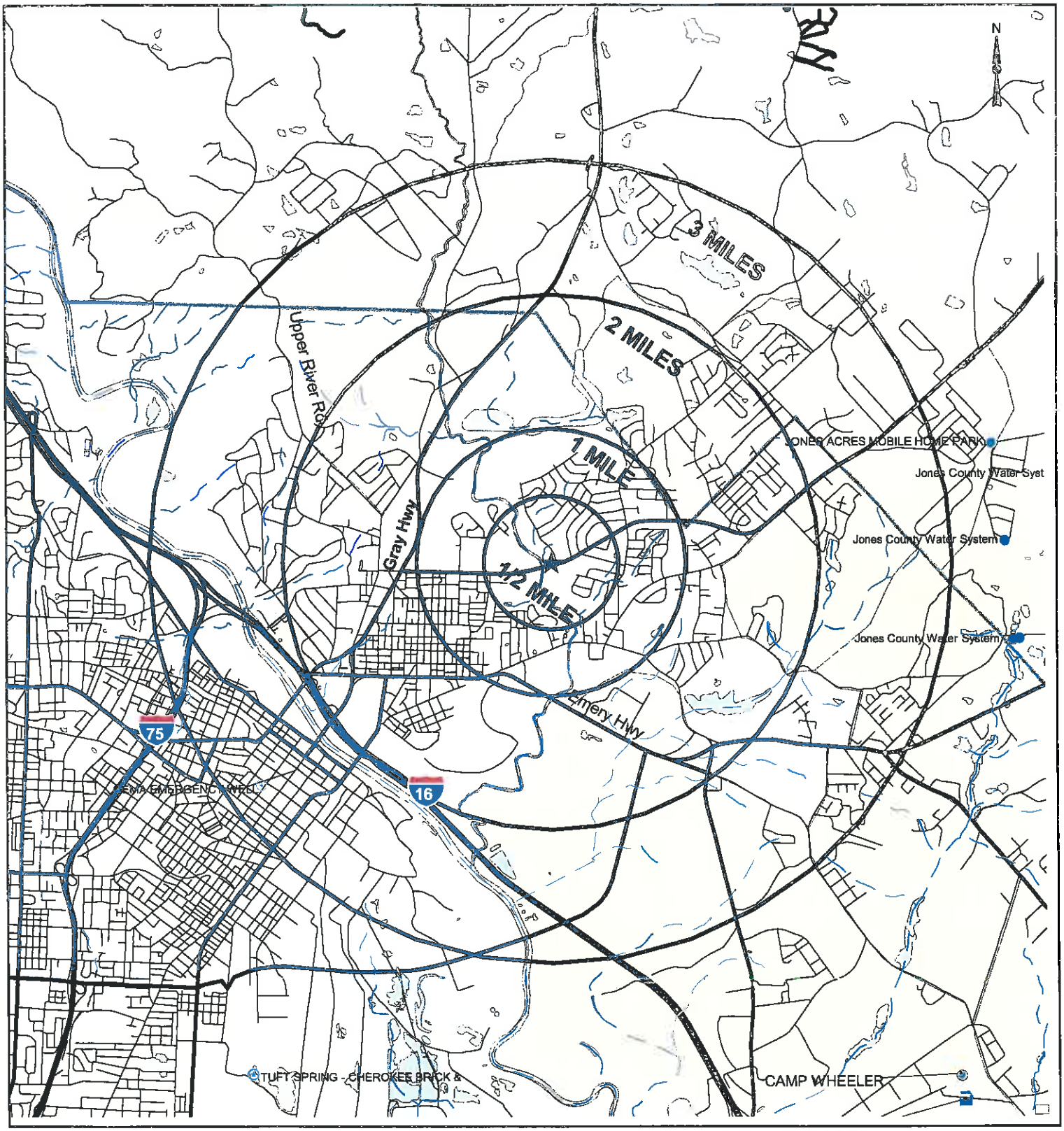
US Liquids - Macon
100 Waste Research Drive
Macon, Bibb County

Scale: 1 inch = 1 mile

32 48' 25" 83 38' 06"

Sources: Wells from USGS GWSI (1999); EPD WRB Non-Municipal Wells (1997); EPD HWMB field surveys (2004); Surface Water Intakes from EPD GSB DR96-27(1996); Roads, Rivers, Wetlands from Georgia DOT (2000); Census data from U.S. Bureau of Census (1990)

1/20/04



Roads
State and US Highways
Interstate Highways
Rivers/Streams
Lake/Pond
Swamp/Marsh
Census Block Group Boundaries
Census Block Group with >zero domestic well

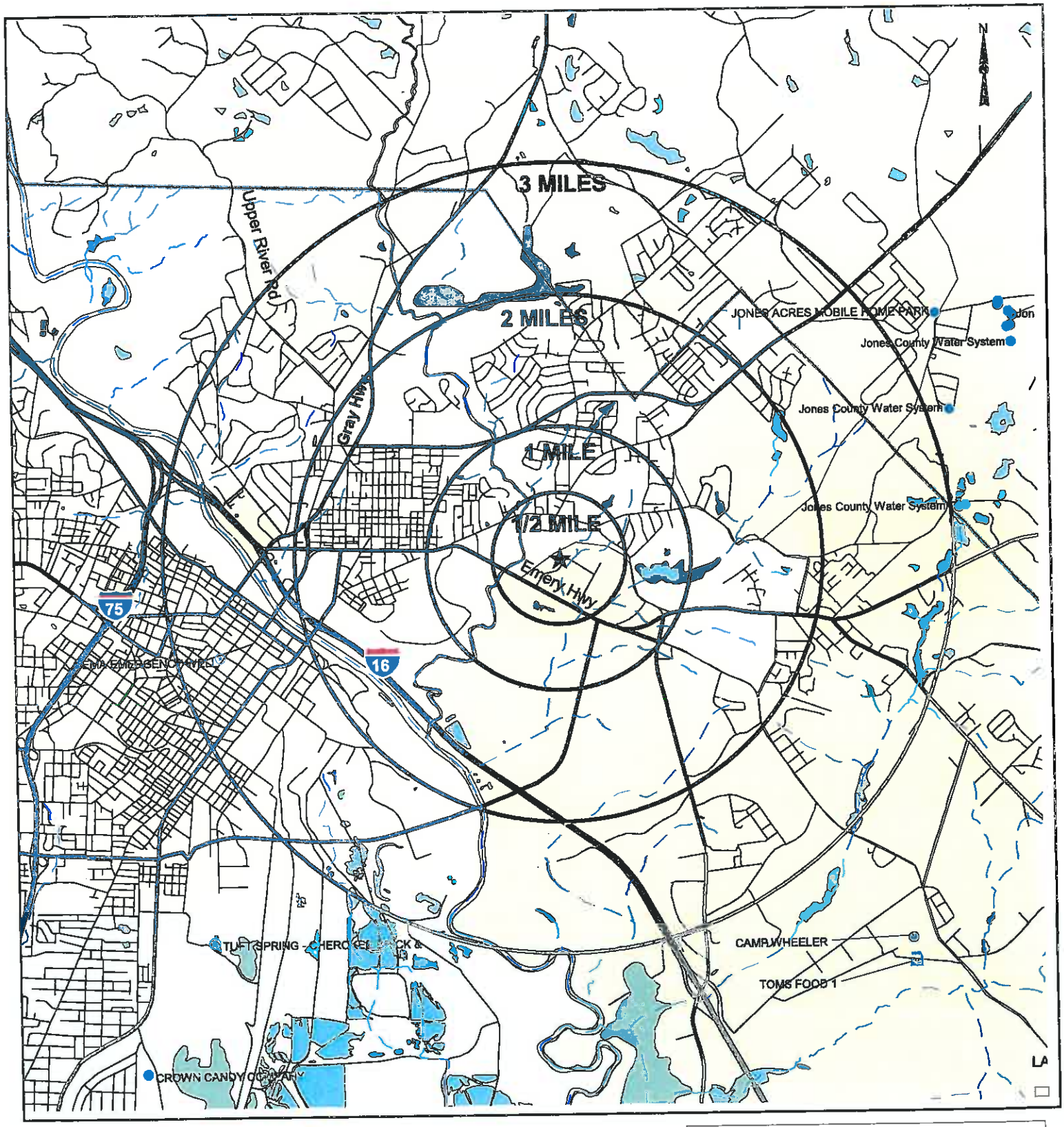
Drinking Water
INDUSTRIAL

Vacant Property
1610 Shurling Drive
Macon, Bibb County

Scale: 1 inch = 1 mile
32 51' 39" 83 35' 45"

Sources: Wells from USGS GWSI (1999); EPD WRB Non-Municipal Wells (1997); EPD HWMB field surveys (2004); Surface Water Intakes from EPD GSB DR96-27(1996); Roads, Rivers, Wetlands from Georgia DOT (2000); Census data from U.S. Bureau of Census (1990)

01/10/08



Roads
State and US Highways
Interstate Highways
Rivers/Streams
Lake/Pond
Swamp/Marsh
Census Block Group Boundaries
Census Block Group with >zero domestic well

Public Supply
INDUSTRIAL
Drinking Water

Walker Concrete
690 Commerce Drive
Macon, Bibb County, Georgia

Scale: 1 inch = 1 mile
32 50 51" 83 35' 18"

Sources: Wells from USGS GWSI (1999); EPD WRB Non-Municipal Wells (1997); EPD HWMB field surveys (2004); Surface Water Intakes from EPD GSB DR96-27(1996); Roads, Rivers, Wetlands from Georgia DOT (2000); Census data from U.S. Bureau of Census (1990)

04/29/14

GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

Richard E. Dunn, Director

Land Protection Branch
2 Martin Luther King, Jr. Drive
Suite 1054, East Tower
Atlanta, Georgia 30334
404-657-8600

October 24, 2018

TRIP REPORT

Site Name and Location: 1217 Martin Luther King Jr. Blvd.
Macon, Bibb County

Trip by: Nicole Vermillion, Geologist
Carolyn Daniels, P.G.

Date of Trip: October 9, 2018

Persons Contacted: n/a

Reference: September 14, 2018 Release Notification

Comments:
On October 9, 2018, EPD representatives conducted a release notification site visit at the three adjacent parcels (subject property), located at 1217 and 1223 Martin Luther King Jr. Blvd, and 1216 Third Street in Macon, Georgia. The purpose of the site visit was to evaluate the site and compile information necessary to complete the release notification scoring of the site in accordance with the Reportable Quantities Screening Method (RQSM), and the Rules for Hazardous Site Response.

The 0.23-acre subject property consists of three adjoining parcels and is currently vacant (Photographs 1-3). According to the release notification, trichloroethene (TCE) was detected above the Maximum Contaminant Level (MCL) of 5 ug/L in one of three temporary monitoring wells on-site. The highest concentration of TCE was detected in groundwater at a concentration of 64 ug/L in well DW-1 (12'), along the eastern boundary of the 1217 Martin Luther King Jr. Blvd parcel. Additionally, tetrachloroethene (PCE) was detected above the MCL of 5 ug/L in one of the three temporary monitoring wells on-site. The highest concentration of PCE was detected in groundwater at a concentration of 1,100 ug/L in monitoring well DW-1. EPD was not able to confirm the location of the monitoring wells on-site. No regulated substances were detected above the notification concentrations (NCs) in soil.

Various commercial businesses such as a grocery store, restaurant and auto body shop operated on the subject property from the 1950s until the on-site buildings were demolished in the 2000s. The building slab remains on the 1217 Martin Luther King Jr. Blvd parcel.

The subject property is located in a mixed residential, commercial and light industrial area of Macon (Photograph 8). The subject property is bound to the north by a vacant lot, a commercial property and a residence (Photographs 5 & 6) located along Hazel Street. Vacant land (mixed grass and concrete cover) is located farther across Hazel Street. Third Street borders the subject property to the west. Vacant undeveloped land is located farther to the west across Third Street. The subject property is bordered by Martin Luther King Jr. Blvd. to the east, across which is a vacant lot (Photograph 7). According to the notification, this property to the east is the location of a former dry cleaner, garage and filling station. The subject property is bound to the south by undeveloped vacant land (Photograph 9). 446 Hazel Street, the nearest residence, is located approximately 120 feet northwest of the 1217 Martin Luther King Jr. Blvd parcel. The subject property has unlimited access.

As part of the notification site visit, EPD conducted a drive-by well survey within a 1-mile radius. No drinking water wells were identified. Based on groundwater sampling on the subject property, the direction of groundwater flow varies across the site, but is generally to the south toward DW-2. A City of Macon Emergency Management well is located at 770 Poplar Street, approximately 0.75 miles north of the subject property.

Attachments:

- Photograph log of the September 14, 2018 Release Notification Site Visit.

Recommendation:
Proceed with scoring the notification.

PHOTOGRAPHS

Site Name: 1217 MLK Jr. Blvd Macon, Georgia	Photograph 1 of 10	County: Bibb
Date: 10/9/2018	Photographer: Nicole Vermillion, Response and Remediation Program	
Description: View of the subject property; facing southwest.		

Site Name: 1217 MLK Jr. Blvd Macon, Georgia	Photograph 2 of 10	County: Bibb
Date: 10/9/2018	Photographer: Nicole Vermillion, Response and Remediation Program	
Description: View of the subject property; facing south.		

Site Name: 1217 MLK Jr. Blvd Macon, Georgia	Photograph 3 of 10	County: Bibb
Date: 10/9/2018	Photographer: Nicole Vermillion, Response and Remediation Program	
Description: View of the subject property across MLK Jr. Blvd.; facing southwest.		

Site Name: 1217 MLK Jr. Blvd Macon, Georgia	Photograph 4 of 10	County: Bibb
Date: 10/9/2018	Photographer: Nicole Vermillion, Response and Remediation Program	
Description: View of the 1223 MLK Jr. parcel; facing west.		

Site Name: 1217 MLK Jr. Blvd Macon, Georgia	Photograph 5 of 10	County: Bibb
Date: 10/9/2018	Photographer: Nicole Vermillion, Response and Remediation Program	
Description: View of the north adjacent property (432 Hazel Street) from the 1216 3rd Street parcel; facing north.		

Site Name: 1217 MLK Jr. Blvd Macon, Georgia	Photograph 6 of 10	County: Bibb
Date: 10/9/2018	Photographer: Nicole Vermillion, Response and Remediation Program	
Description: View of the adjacent commercial and residential properties, 432 and 446 Hazel Street, respectively, facing west.		

Site Name: 1217 MLK Jr. Blvd Macon, Georgia	Photograph 7 of 10	County: Bibb
Date: 10/9/2018	Photographer: Nicole Vermillion, Response and Remediation Program	

Description: View of the east adjacent property across MLK Jr. Blvd, facing east. This vacant parcel is the location of the former dry cleaner and filling station referenced in the release notification.

Site Name: 1217 MLK Jr. Blvd Macon, Georgia	Photograph 8 of 10	County: Bibb
Date: 10/9/2018	Photographer: Nicole Vermillion, Response and Remediation Program	

Description: View of the surrounding area to the northeast of the subject property; facing northeast. Intersection of Hazel Street and MLK Jr. Blvd.

Site Name: 1217 MLK Jr. Blvd Macon, Georgia	Photograph 9 of 10	County: Bibb
Date: 10/9/2018	Photographer: Nicole Vermillion, Response and Remediation Program	
Description: View of south adjacent parcel along MLK Jr. Blvd; facing west.		

Site Name: 1217 MLK Jr. Blvd Macon, Georgia	Photograph 10 of 10	County: Bibb
Date: 10/9/2018	Photographer: Nicole Vermillion, Response and Remediation Program	
Description: View of the adjacent property and surrounding area to the south; facing southwest.		

APPENDIX J
ProUCL Input and Output Files

Nonparametric UCL Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	ProUCL 5.12/25/2019 11:24:26 AM
From File	Pb Avg Analysis Section - ProUCL Input.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Section 1

General Statistics

Total Number of Observations	55	Number of Distinct Observations	53
		Number of Missing Observations	0
Minimum	1.5	Mean	573.7
Maximum	8020	Median	323
SD	1207	Std. Error of Mean	162.8
Coefficient of Variation	2.105	Skewness	5.036
Mean of logged Data	5.5	SD of logged Data	1.349

Nonparametric Distribution Free UCL Statistics

Data appear Approximate Lognormal Distributed at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	846.2	95% Adjusted-CLT UCL (Chen-1995)	959.7
		95% Modified-t UCL (Johnson-1978)	864.6

Nonparametric Distribution Free UCLs

95% CLT UCL	841.5	95% Jackknife UCL	846.2
95% Standard Bootstrap UCL	838.2	95% Bootstrap-t UCL	1335
95% Hall's Bootstrap UCL	1831	95% Percentile Bootstrap UCL	854.2
95% BCA Bootstrap UCL	999		
90% Chebyshev(Mean, Sd) UCL	1062	95% Chebyshev(Mean, Sd) UCL	1283
97.5% Chebyshev(Mean, Sd) UCL	1590	99% Chebyshev(Mean, Sd) UCL	2194

Suggested UCL to Use

Data appear Approximate Lognormal, May want to try Lognormal Distribution

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Section 2

General Statistics

Total Number of Observations	203	Number of Distinct Observations	186
		Number of Missing Observations	433
Minimum	0.5	Mean	390.2
Maximum	3110	Median	265
SD	408.6	Std. Error of Mean	28.67
Coefficient of Variation	1.047	Skewness	2.141
Mean of logged Data	5.156	SD of logged Data	1.723

Nonparametric Distribution Free UCL Statistics

Data appear Approximate Gamma Distributed at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	437.6	95% Adjusted-CLT UCL (Chen-1995)	441.9
		95% Modified-t UCL (Johnson-1978)	438.3

Nonparametric Distribution Free UCLs

95% CLT UCL	437.3	95% Jackknife UCL	437.6
95% Standard Bootstrap UCL	437.9	95% Bootstrap-t UCL	441.6
95% Hall's Bootstrap UCL	441.2	95% Percentile Bootstrap UCL	437.8
95% BCA Bootstrap UCL	439.8		
90% Chebyshev(Mean, Sd) UCL	476.2	95% Chebyshev(Mean, Sd) UCL	515.2
97.5% Chebyshev(Mean, Sd) UCL	569.2	99% Chebyshev(Mean, Sd) UCL	675.5

Suggested UCL to Use

Data appear Approximate Gamma, May want to try Gamma Distribution

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Section 3

General Statistics

Total Number of Observations	270	Number of Distinct Observations	253
		Number of Missing Observations	366
Minimum	0.5	Mean	462.2
Maximum	1290	Median	409.5
SD	383.2	Std. Error of Mean	23.32
Coefficient of Variation	0.829	Skewness	0.511
Mean of logged Data	5.491	SD of logged Data	1.45

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	500.6	95% Adjusted-CLT UCL (Chen-1995)	501.3
		95% Modified-t UCL (Johnson-1978)	500.8

Nonparametric Distribution Free UCLs

95% CLT UCL	500.5	95% Jackknife UCL	500.6
95% Standard Bootstrap UCL	499.7	95% Bootstrap-t UCL	503.9
95% Hall's Bootstrap UCL	500.8	95% Percentile Bootstrap UCL	499.9
95% BCA Bootstrap UCL	502.9		
90% Chebyshev(Mean, Sd) UCL	532.1	95% Chebyshev(Mean, Sd) UCL	563.8
97.5% Chebyshev(Mean, Sd) UCL	607.8	99% Chebyshev(Mean, Sd) UCL	694.2

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL	563.8		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Section 4

General Statistics

Total Number of Observations	108	Number of Distinct Observations	101
		Number of Missing Observations	528
Minimum	0.8	Mean	346.7
Maximum	1299	Median	254
SD	326.6	Std. Error of Mean	31.43
Coefficient of Variation	0.942	Skewness	0.927
Mean of logged Data	5.023	SD of logged Data	1.702

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	398.9	95% Adjusted-CLT UCL (Chen-1995)	401.4
		95% Modified-t UCL (Johnson-1978)	399.3

Nonparametric Distribution Free UCLs

95% CLT UCL	398.4	95% Jackknife UCL	398.9
95% Standard Bootstrap UCL	398.4	95% Bootstrap-t UCL	403.4
95% Hall's Bootstrap UCL	404.1	95% Percentile Bootstrap UCL	400.6
95% BCA Bootstrap UCL	400.8		
90% Chebyshev(Mean, Sd) UCL	441	95% Chebyshev(Mean, Sd) UCL	483.7
97.5% Chebyshev(Mean, Sd) UCL	543	99% Chebyshev(Mean, Sd) UCL	659.4

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL	483.7		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Section1-2

General Statistics

Total Number of Observations	258	Number of Distinct Observations	234
		Number of Missing Observations	378
Minimum	0.5	Mean	429.3
Maximum	8020	Median	271.5
SD	665.7	Std. Error of Mean	41.45
Coefficient of Variation	1.551	Skewness	6.922
Mean of logged Data	5.229	SD of logged Data	1.654

Nonparametric Distribution Free UCL Statistics

Data appear Approximate Gamma Distributed at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	497.7	95% Adjusted-CLT UCL (Chen-1995)	516.6
		95% Modified-t UCL (Johnson-1978)	500.7

Nonparametric Distribution Free UCLs

95% CLT UCL	497.5	95% Jackknife UCL	497.7
95% Standard Bootstrap UCL	499	95% Bootstrap-t UCL	530.2
95% Hall's Bootstrap UCL	593.4	95% Percentile Bootstrap UCL	504.6
95% BCA Bootstrap UCL	520.8		
90% Chebyshev(Mean, Sd) UCL	553.6	95% Chebyshev(Mean, Sd) UCL	610
97.5% Chebyshev(Mean, Sd) UCL	688.1	99% Chebyshev(Mean, Sd) UCL	841.7

Suggested UCL to Use

Data appear Approximate Gamma, May want to try Gamma Distribution

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

191	**Section 3-4**											
192												
193	**General Statistics**											
194						Total Number of Observations	378			Number of Distinct Observations	329	
195										Number of Missing Observations	258	
196						Minimum	0.5			Mean	429.2	
197						Maximum	1299			Median	330	
198						SD	371.2			Std. Error of Mean	19.09	
199						Coefficient of Variation	0.865			Skewness	0.631	
200						Mean of logged Data	5.346			SD of logged Data	1.58	
201												
202	**Nonparametric Distribution Free UCL Statistics**											
203	**Data do not follow a Discernible Distribution (0.05)**											
204												
205	**Assuming Normal Distribution**											
206						**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**		
207						95% Student's-t UCL	460.6			95% Adjusted-CLT UCL (Chen-1995)	461.2	
208										95% Modified-t UCL (Johnson-1978)	460.7	
209												
210	**Nonparametric Distribution Free UCLs**											
211						95% CLT UCL	460.6			95% Jackknife UCL	460.6	
212						95% Standard Bootstrap UCL	461.1			95% Bootstrap-t UCL	461.8	
213						95% Hall's Bootstrap UCL	461.4			95% Percentile Bootstrap UCL	460.3	
214						95% BCA Bootstrap UCL	462.1					
215						90% Chebyshev(Mean, Sd) UCL	486.4			95% Chebyshev(Mean, Sd) UCL	512.4	
216						97.5% Chebyshev(Mean, Sd) UCL	548.4			99% Chebyshev(Mean, Sd) UCL	619.1	
217												
218	**Suggested UCL to Use**											
219						95% Chebyshev (Mean, Sd) UCL	512.4					
220												
221	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
222	Recommendations are based upon data size, data distribution, and skewness.											
223	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
224	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
225												
226												

Section All

General Statistics

Total Number of Observations	636	Number of Distinct Observations	524
		Number of Missing Observations	0
Minimum	0.5	Mean	429.2
Maximum	8020	Median	313.2
SD	511.1	Std. Error of Mean	20.26
Coefficient of Variation	1.191	Skewness	6.308
Mean of logged Data	5.298	SD of logged Data	1.61

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	462.6	95% Adjusted-CLT UCL (Chen-1995)	468
		95% Modified-t UCL (Johnson-1978)	463.4

Nonparametric Distribution Free UCLs

95% CLT UCL	462.6	95% Jackknife UCL	462.6
95% Standard Bootstrap UCL	462.1	95% Bootstrap-t UCL	468.7
95% Hall's Bootstrap UCL	472.8	95% Percentile Bootstrap UCL	462.5
95% BCA Bootstrap UCL	467.9		
90% Chebyshev(Mean, Sd) UCL	490	95% Chebyshev(Mean, Sd) UCL	517.5
97.5% Chebyshev(Mean, Sd) UCL	555.8	99% Chebyshev(Mean, Sd) UCL	630.8

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL	517.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Section 1 Soil Lead Data Summary - ProUCL Input

Record	Location	D1 - feet	D2 - feet	Date	Parameter	Result	Units
1	B-39	0	0	2/25/2000	Lead	1.5	mg/Kg
2	LL10	1	1	7/21/2011	Lead	11.2	mg/Kg
3	OO12	1	1	7/21/2011	Lead	33.7	mg/Kg
4	NN14	1	1	7/21/2011	Lead	51.9	mg/Kg
5	PP13	1	1	7/21/2011	Lead	58.4	mg/Kg
6	OO14	1	1	7/21/2011	Lead	60.2	mg/Kg
7	PP14	1	1	7/21/2011	Lead	60.6	mg/Kg
8	PP12	0	1	7/23/2011	Lead	65.0	mg/Kg
9	B-24	1	1	2/25/2000	Lead	80.0	mg/Kg
10	MM11	1	1	7/21/2011	Lead	80.0	mg/Kg
11	B-19	1	1	3/6/2000	Lead	92.0	mg/Kg
12	LL9	1	1	7/21/2011	Lead	100.0	mg/Kg
13	LL12	1	1	7/21/2011	Lead	108.0	mg/Kg
14	LL9-S	0	1	7/23/2011	Lead	115.0	mg/Kg
15	OO13	1	1	7/21/2011	Lead	128.0	mg/Kg
16	MM12	1	1	7/21/2011	Lead	134.0	mg/Kg
17	B-47	1	1	6/14/2000	Lead	157.4	mg/Kg
18	MM9	1	1	7/21/2011	Lead	165.0	mg/Kg
19	NN12	1	1	7/21/2011	Lead	169.0	mg/Kg
20	LL13	1	1	7/21/2011	Lead	172.0	mg/Kg
21	B-37	1	1	2/25/2000	Lead	190.0	mg/Kg
22	B-65-E4	0	0	2/8/2003	Lead	206.0	mg/Kg
23	b-65-22	0	1	3/30/2009	Lead, field	217.0	mg/Kg
24	B-38	1	1	2/25/2000	Lead	230.0	mg/Kg
25	b-65-22	0	1	3/30/2009	Lead	237.0	mg/Kg
26	B-23-NE	0	0	10/3/2002	Lead	239.0	mg/Kg
27	B-46	1	1	6/14/2000	Lead	249.0	mg/Kg
28	LL11	1	1	7/21/2011	Lead	323.0	mg/Kg
29	LL14	1	1	7/21/2011	Lead	323.0	mg/Kg
30	B-48	1	1	6/15/2000	Lead	324.2	mg/Kg
31	LL11-S	0	1	7/23/2011	Lead	327.0	mg/Kg
32	NN9	1	1	7/21/2011	Lead	344.0	mg/Kg
33	HA-08	1	1	3/6/2000	Lead	370.0	mg/Kg
34	MM10	1	1	7/21/2011	Lead	383.0	mg/Kg
35	HA-07	1	1	3/6/2000	Lead	390.0	mg/Kg
36	KK14	0	1	7/23/2011	Lead	396.0	mg/Kg
37	b-65-27	0	1	3/30/2009	Lead, field	424.7	mg/Kg
38	b-65-21	0	1	3/30/2009	Lead, field	427.1	mg/Kg
39	NN13	1	1	7/21/2011	Lead	429.0	mg/Kg
40	B-40	1	1	2/25/2000	Lead	440.0	mg/Kg
41	B-50	1	1	6/15/2000	Lead	464.7	mg/Kg
42	B-23-SW	0	0	10/3/2002	Lead	476.0	mg/Kg
43	b-65-24	0	1	3/30/2009	Lead, field	510.1	mg/Kg
44	NN10	1	1	7/21/2011	Lead	542.0	mg/Kg
45	B-23-SE	0	0	10/3/2002	Lead	567.0	mg/Kg
46	B-23	0	0	10/3/2002	Lead	630.0	mg/Kg

Grey = detection limit applied

D1 - top of sample

D2 - bottom of sample

Record	Location	D1 - feet	D2 - feet	Date	Parameter	Result	Units
47	B-23-NW	0	0	10/3/2002	Lead	654.0	mg/Kg
48	b-65-24	0	1	3/30/2009	Lead	685.0	mg/Kg
49	b-65-28	0	1	3/30/2009	Lead, field	725.9	mg/Kg
50	KK12	0	1	7/23/2011	Lead	861.0	mg/Kg
51	MM13	1	1	7/21/2011	Lead	1,200.0	mg/Kg
52	b-65-23	0	1	3/30/2009	Lead, field	1,276.2	mg/Kg
53	b-65-23	0	1	3/30/2009	Lead	2,560.0	mg/Kg
54	RR21-SR	0	1	8/13/2011	Lead	4,070.0	mg/Kg
55	OO10-SP	0	1	8/13/2011	Lead	8,020.0	mg/Kg

Grey = detection limit applied
D1 - top of sample
D2 - bottom of sample

Record	Location	D1 - feet	D2 - feet	Date	Parameter	Result	Units
1	b-63	0	0	9/30/2002	Lead	0.5	mg/Kg
2	b-63-sw	0	0	10/1/2002	Lead	0.5	mg/Kg
3	ha-01	0	0	10/1/2002	Lead	0.5	mg/Kg
4	ha-01-ne	0	0	10/1/2002	Lead	0.5	mg/Kg
5	ha-01-sw	0	0	10/2/2002	Lead	0.5	mg/Kg
6	HH20-S	0	1	7/30/2011	Lead	0.5	mg/Kg
7	ha-01-ne	0	0	10/1/2002	Lead	0.7	mg/Kg
8	ha-01-nw	0	0	10/1/2002	Lead	2.1	mg/Kg
9	b-65	0	0	10/4/2002	Lead	4.5	mg/Kg
10	II23	0	1	7/23/2011	Lead	5.7	mg/Kg
11	HH27	0	1	7/30/2011	Lead	7.0	mg/Kg
12	b-63-ese5	0	0	11/16/2003	Lead	7.0	mg/Kg
13	LL25	1	1	7/22/2011	Lead	8.9	mg/Kg
14	HH25	0	1	7/30/2011	Lead	9.8	mg/Kg
15	JJ26	1	1	7/22/2011	Lead	12.4	mg/Kg
16	HH21	1	1	7/30/2011	Lead	15.9	mg/Kg
17	ha-01	0	0	10/1/2002	Lead	19.6	mg/Kg
18	JJ37-SS	0	1	8/13/2011	Lead	20.5	mg/Kg
19	HH26	1	1	7/30/2011	Lead	21.2	mg/Kg
20	HH21-SS	0	1	7/30/2011	Lead	21.6	mg/Kg
21	GG36	0	1	7/16/2011	Lead	22.2	mg/Kg
22	NN25	0	1	7/30/2011	Lead	23.1	mg/Kg
23	GG38	1	1	7/16/2011	Lead	25.2	mg/Kg
24	JJ18	0	1	7/23/2011	Lead	25.7	mg/Kg
25	JJ31-S	0	1	8/16/2011	Lead	26.2	mg/Kg
26	FF38	0	1	7/16/2011	Lead	27.3	mg/Kg
27	KK33	1	1	8/13/2011	Lead	30.2	mg/Kg
28	KK32	1	1	8/16/2011	Lead	31.3	mg/Kg
29	MM26	0	1	7/23/2011	Lead	31.8	mg/Kg
30	KK31-S	0	1	8/16/2011	Lead	33.3	mg/Kg
31	II25	0	1	7/23/2011	Lead	33.9	mg/Kg
32	KK29	1	1	7/23/2011	Lead	34.8	mg/Kg
33	OO15	1	1	7/21/2011	Lead	37.1	mg/Kg
34	HH37	1	1	8/4/2011	Lead	38.4	mg/Kg
35	JJ35-2	1	1	8/10/2011	Lead	42.6	mg/Kg
36	gg39-S	0	1	7/16/2011	Lead	43.7	mg/Kg
37	O28-SE	0	1	8/11/2011	Lead	45.8	mg/Kg
38	JJ39-SN	0	1	8/13/2011	Lead	47.2	mg/Kg
39	MM15	1	1	7/21/2011	Lead	49.6	mg/Kg
40	PP24	0	1	8/1/2011	Lead	52.6	mg/Kg
41	GG39	0	1	7/16/2011	Lead	55.6	mg/Kg
42	RR24-S	0	1	8/16/2011	Lead	58.7	mg/Kg
43	II27	1	1	7/22/2011	Lead	61.3	mg/Kg
44	LL24	1	1	7/22/2011	Lead	62.2	mg/Kg
45	JJ33-S	0	1	8/13/2011	Lead	66.5	mg/Kg
46	I51	1	1	8/16/2011	Lead	68.6	mg/Kg

Grey = detection limit applied

D1 - top of sample

D2 - bottom of sample

Record	Location	D1 - feet	D2 - feet	Date	Parameter	Result	Units
47	LL26	1	1	7/22/2011	Lead	70.1	mg/Kg
48	OO17	1	1	7/21/2011	Lead	73.9	mg/Kg
49	II38-S	0	1	8/13/2011	Lead	75.1	mg/Kg
50	OO24	1	1	8/1/2011	Lead	76.3	mg/Kg
51	KK28	1	1	7/23/2011	Lead	78.4	mg/Kg
52	PP26	0	1	8/1/2011	Lead	82.8	mg/Kg
53	LL20	1	1	7/22/2011	Lead	83.8	mg/Kg
54	B-52	1	1	6/21/2000	Lead	89.3	mg/Kg
55	P27	1	1	8/16/2011	Lead	90.9	mg/Kg
56	MM19	1	1	7/22/2011	Lead	92.5	mg/Kg
57	NN26-S	0	1	8/13/2011	Lead	96.6	mg/Kg
58	PP27	0	1	8/1/2011	Lead	101.0	mg/Kg
59	B-63-N2	0	0	10/1/2002	Lead	103.0	mg/Kg
60	I51-S	0	1	8/16/2011	Lead	107.0	mg/Kg
61	b-65-s8	0	0	2/8/2003	Lead	108.0	mg/Kg
62	OO27-S	0	1	8/1/2011	Lead	108.0	mg/Kg
63	II29	1	1	7/23/2011	Lead	109.0	mg/Kg
64	HH37-S	0	1	8/4/2011	Lead	110.0	mg/Kg
65	II26	1	1	7/22/2011	Lead	121.0	mg/Kg
66	KK15	0	1	7/23/2011	Lead	123.0	mg/Kg
67	RR23-S	0	1	8/16/2011	Lead	130.0	mg/Kg
68	MM25	1	1	7/22/2011	Lead	138.0	mg/Kg
69	K39-S	0	1	8/9/2011	Lead	141.0	mg/Kg
70	NN25-SE	0	1	8/10/2011	Lead	141.0	mg/Kg
71	gg38-S	0	1	7/16/2011	Lead	156.0	mg/Kg
72	J39	0	1	7/27/2011	Lead	157.0	mg/Kg
73	KK18	1	1	7/21/2011	Lead	159.0	mg/Kg
74	LL17	1	1	7/21/2011	Lead	161.0	mg/Kg
75	OO26-2	1	1	8/13/2011	Lead	161.0	mg/Kg
76	PP19-S	1	1	7/22/2011	Lead	166.0	mg/Kg
77	SD-04	1	1	6/16/2000	Lead	166.7	mg/Kg
78	OO26	1	1	8/1/2011	Lead	169.0	mg/Kg
79	NN20	1	1	7/22/2011	Lead	170.0	mg/Kg
80	OO27-S2	0	1	8/13/2011	Lead	173.0	mg/Kg
81	QQ16	0	1	7/23/2011	Lead	176.0	mg/Kg
82	JJ19	1	1	7/22/2011	Lead	178.0	mg/Kg
83	B-65-4	0	0.5	2/24/2009	Lead	181.0	mg/Kg
84	LL27	1	1	7/23/2011	Lead	187.0	mg/Kg
85	OO27	1	1	8/1/2011	Lead	189.0	mg/Kg
86	NN19	1	1	7/22/2011	Lead	190.0	mg/Kg
87	FF39	1	1	7/16/2011	Lead	194.0	mg/Kg
88	b-63-ene5	0	0	1/16/2003	Lead	199.0	mg/Kg
89	GG26	0	1	7/30/2011	Lead	200.0	mg/Kg
90	NN17	1	1	7/21/2011	Lead	202.0	mg/Kg
91	P26-S	0	1	8/16/2011	Lead	205.0	mg/Kg
92	SD-05	1	1	6/20/2000	Lead	205.7	mg/Kg

Grey = detection limit applied

D1 - top of sample

D2 - bottom of sample

Record	Location	D1 - feet	D2 - feet	Date	Parameter	Result	Units
93	B-63-ESE3	0	0	11/8/2002	Lead	206.0	mg/Kg
94	NN21	1	1	7/22/2011	Lead	229.0	mg/Kg
95	LL22	1	1	7/22/2011	Lead	235.0	mg/Kg
96	NN18	1	1	7/21/2011	Lead	241.0	mg/Kg
97	JJ30	0	1	7/23/2011	Lead	243.0	mg/Kg
98	B-65-5	0	0.5	2/24/2009	Lead	250.0	mg/Kg
99	OO16	1	1	7/21/2011	Lead	251.0	mg/Kg
100	b-42a-66	0	0.5	3/11/2009	Lead, field	251.6	mg/Kg
101	b-65-nw	0	0	10/4/2002	Lead	253.0	mg/Kg
102	LL28	1	1	7/23/2011	Lead	265.0	mg/Kg
103	B-65-10	0	0.5	2/24/2009	Lead	278.0	mg/Kg
104	II21	0	1	7/23/2011	Lead	283.0	mg/Kg
105	JJ28	1	1	7/23/2011	Lead	284.0	mg/Kg
106	O28-S	0	1	8/4/2011	Lead	286.0	mg/Kg
107	NN20-S	0	1	8/16/2011	Lead	294.0	mg/Kg
108	OO25	1	1	8/1/2011	Lead	295.0	mg/Kg
109	NN22	1	1	7/22/2011	Lead	296.0	mg/Kg
110	HH21-SE	0	1	7/30/2011	Lead	304.0	mg/Kg
111	PP21	1	1	7/22/2011	Lead	307.0	mg/Kg
112	OO25-S	0	1	8/1/2011	Lead	318.0	mg/Kg
113	KK19	1	1	7/22/2011	Lead	319.0	mg/Kg
114	JJ36-SN	0	1	8/10/2011	Lead	321.0	mg/Kg
115	MM28	0	1	7/23/2011	Lead	339.0	mg/Kg
116	b-42a-125	0	1	3/30/2009	Lead, field	344.5	mg/Kg
117	b-65-sw3	0	0	1/16/2003	Lead	346.0	mg/Kg
118	JJ24	1	1	7/22/2011	Lead	359.0	mg/Kg
119	OO26-S	0	1	8/1/2011	Lead	364.0	mg/Kg
120	LL15	1	1	7/21/2011	Lead	379.0	mg/Kg
121	JJ29	1	1	7/23/2011	Lead	387.0	mg/Kg
122	b-63-ne2	0	0	9/30/2002	Lead	387.0	mg/Kg
123	QQ19	0	1	7/23/2011	Lead	390.0	mg/Kg
124	LL16	1	1	7/21/2011	Lead	394.0	mg/Kg
125	b-42a-126	0	1	3/30/2009	Lead, field	394.3	mg/Kg
126	b-42a-122	0	1	3/30/2009	Lead, field	397.6	mg/Kg
127	N31-SS	0	1	7/14/2011	Lead	408.0	mg/Kg
128	QQ17	0	1	7/23/2011	Lead	419.0	mg/Kg
129	b15-9	0	1	3/30/2009	Lead, field	426.7	mg/Kg
130	ha-01-nw	0	0	10/1/2002	Lead	428.0	mg/Kg
131	b15-7	0	1	3/30/2009	Lead, field	431.0	mg/Kg
132	b15-6	0	1	3/30/2009	Lead, field	432.3	mg/Kg
133	GG40	1	1	7/16/2011	Lead	435.0	mg/Kg
134	PP25	0	1	8/1/2011	Lead	459.0	mg/Kg
135	KK17	0	1	7/23/2011	Lead	461.0	mg/Kg
136	RR25-S	0	1	8/16/2011	Lead	461.0	mg/Kg
137	HH29	0	1	7/23/2011	Lead	465.0	mg/Kg
138	b-65-ne	0	0	10/4/2002	Lead	471.0	mg/Kg

Grey = detection limit applied

D1 - top of sample

D2 - bottom of sample

Record	Location	D1 - feet	D2 - feet	Date	Parameter	Result	Units
139	B-65-1	0	0.5	2/24/2009	Lead	475.0	mg/Kg
140	B-22	1	1	6/16/2000	Lead	479.8	mg/Kg
141	B-63-2	0	0.5	2/24/2009	Lead	480.0	mg/Kg
142	LL29	1	1	7/23/2011	Lead	487.0	mg/Kg
143	OO25-2	1	1	8/10/2011	Lead	487.0	mg/Kg
144	II28	1	1	7/23/2011	Lead	500.0	mg/Kg
145	b-63-se2	0	0	10/1/2002	Lead	513.0	mg/Kg
146	QQ20	0	1	7/23/2011	Lead	518.0	mg/Kg
147	KK34	1	1	8/10/2011	Lead	519.0	mg/Kg
148	NN9-SP	0	1	8/13/2011	Lead	519.0	mg/Kg
149	OO24-S	0	1	8/1/2011	Lead	523.0	mg/Kg
150	MM18	1	1	7/21/2011	Lead	528.0	mg/Kg
151	N30-S	0	1	7/14/2011	Lead	528.0	mg/Kg
152	B-65-3	0	0.5	2/24/2009	Lead	546.0	mg/Kg
153	LL31	0	1	7/30/2011	Lead	549.0	mg/Kg
154	B-65-2	0	0.5	2/24/2009	Lead	560.0	mg/Kg
155	JJ35-SW	0	1	8/10/2011	Lead	570.0	mg/Kg
156	b-65-14	0	1	3/30/2009	Lead, field	581.5	mg/Kg
157	I39	0	1	7/27/2011	Lead	594.0	mg/Kg
158	KK34-SE	0	1	8/10/2011	Lead	594.0	mg/Kg
159	KK40	1	1	7/18/2011	Lead	644.0	mg/Kg
160	NN16	1	1	7/21/2011	Lead	645.0	mg/Kg
161	HA-01-a	0	0.5	2/24/2009	Lead	655.0	mg/Kg
162	b-65-e2	0	0	10/4/2002	Lead	667.0	mg/Kg
163	B-65-11	0	0.5	2/24/2009	Lead	669.0	mg/Kg
164	OO19	1	1	7/22/2011	Lead	703.0	mg/Kg
165	QQ21	1	1	7/23/2011	Lead	715.0	mg/Kg
166	ff40-S	0	1	7/16/2011	Lead	719.0	mg/Kg
167	N29-S	0	1	8/4/2011	Lead	722.0	mg/Kg
168	GG37	1	1	7/16/2011	Lead	723.0	mg/Kg
169	LL18	1	1	7/21/2011	Lead	728.0	mg/Kg
170	PP15	1	1	7/21/2011	Lead	738.0	mg/Kg
171	HH28	1	1	7/23/2011	Lead	741.0	mg/Kg
172	MM20	1	1	7/22/2011	Lead	781.0	mg/Kg
173	N29	0	1	7/14/2011	Lead	799.0	mg/Kg
174	FF40	1	1	7/16/2011	Lead	805.0	mg/Kg
175	MM30	1	1	7/23/2011	Lead	817.0	mg/Kg
176	HH36	0	1	7/16/2011	Lead	827.0	mg/Kg
177	OO24-2	1	1	8/10/2011	Lead	851.0	mg/Kg
178	b-65-25	0	1	3/30/2009	Lead, field	863.3	mg/Kg
179	N31-SW	1	1	7/14/2011	Lead	895.0	mg/Kg
180	OO24-SN	0	1	8/10/2011	Lead	903.0	mg/Kg
181	KK20	1	1	7/22/2011	Lead	919.0	mg/Kg
182	KK39	1	1	7/18/2011	Lead	922.0	mg/Kg
183	ha-01-sw	0	0	10/2/2002	Lead	952.0	mg/Kg
184	b-63-sw	0	0	10/1/2002	Lead	986.0	mg/Kg

Grey = detection limit applied

D1 - top of sample

D2 - bottom of sample

Record	Location	D1 - feet	D2 - feet	Date	Parameter	Result	Units
185	P31	0	1	7/14/2011	Lead	987.0	mg/Kg
186	b-65-sw2	0	0	10/4/2002	Lead	1,050.0	mg/Kg
187	PP16	1	1	7/21/2011	Lead	1,110.0	mg/Kg
188	b-42a-123	0	1	3/30/2009	Lead, field	1,129.5	mg/Kg
189	JJ34-S	0	1	8/10/2011	Lead	1,130.0	mg/Kg
190	OO21	1	1	7/22/2011	Lead	1,160.0	mg/Kg
191	PP22-S	0	1	7/30/2011	Lead	1,220.0	mg/Kg
192	ha-01-sw	0	0.5	2/24/2009	Lead	1,230.0	mg/Kg
193	b-65-25	0	1	3/30/2009	Lead	1,240.0	mg/Kg
194	HA-01-c	0	0.5	2/24/2009	Lead	1,240.0	mg/Kg
195	b-65-sw	0	0	10/4/2002	Lead	1,250.0	mg/Kg
196	NN15	1	1	7/21/2011	Lead	1,260.0	mg/Kg
197	JJ20	1	1	7/22/2011	Lead	1,280.0	mg/Kg
198	b-65-15	0	1	3/30/2009	Lead, field	1,286.7	mg/Kg
199	HH28-S	0	1	7/23/2011	Lead	1,290.0	mg/Kg
200	MM24-S	0	1	7/23/2011	Lead	1,290.0	mg/Kg
201	P30	0	1	7/14/2011	Lead	1,290.0	mg/Kg
202	b-42a-124	0	1	3/30/2009	Lead, field	1,293.6	mg/Kg
203	RR22-SR	0	1	8/13/2011	Lead	3,110.0	mg/Kg

Grey = detection limit applied
D1 - top of sample
D2 - bottom of sample

Record	Location	D1 - feet	D2 - feet	Date	Parameter	Result	Units
1	S64	1	1	7/15/2011	Lead	5.6	mg/Kg
2	b-63-sw	0	0	10/1/2002	Lead	0.5	mg/Kg
3	N57	0	1	7/26/2011	Lead	4.9	mg/Kg
4	M61	1	1	7/15/2011	Lead	5.6	mg/Kg
5	M64	1	1	7/15/2011	Lead	5.6	mg/Kg
6	L55	1	1	7/26/2011	Lead	6.2	mg/Kg
7	M60	1	1	7/15/2011	Lead	6.3	mg/Kg
8	B-90	1	1	9/20/2000	Lead	6.5	mg/Kg
9	M63	1	1	7/15/2011	Lead	6.5	mg/Kg
10	S53	1	1	7/16/2011	Lead	8.6	mg/Kg
11	R53	1	1	7/16/2011	Lead	9.4	mg/Kg
12	K40-SS	0	1	7/27/2011	Lead	10.5	mg/Kg
13	S47	1	1	7/27/2011	Lead	12.9	mg/Kg
14	R54	1	1	7/16/2011	Lead	13.0	mg/Kg
15	S51	1	1	7/16/2011	Lead	14.5	mg/Kg
16	L61-2	1	1	8/3/2011	Lead	15.4	mg/Kg
17	T58	1	1	7/27/2011	Lead	15.5	mg/Kg
18	L51	1	1	7/26/2011	Lead	15.9	mg/Kg
19	S52	1	1	7/16/2011	Lead	20.1	mg/Kg
20	I52-SS	0	1	8/4/2011	Lead	21.5	mg/Kg
21	N53	1	1	8/4/2011	Lead	22.8	mg/Kg
22	S49	1	1	7/27/2011	Lead	24.0	mg/Kg
23	N60	0	1	7/26/2011	Lead	24.5	mg/Kg
24	N54-SN	0	1	8/4/2011	Lead	25.2	mg/Kg
25	gg41-S	0	1	7/16/2011	Lead	26.4	mg/Kg
26	L61	1	1	7/15/2011	Lead	27.2	mg/Kg
27	K62	1	1	7/15/2011	Lead	27.6	mg/Kg
28	J64	1	1	7/25/2011	Lead	28.1	mg/Kg
29	J56	1	1	7/25/2011	Lead	28.6	mg/Kg
30	J60	1	1	7/25/2011	Lead	30.7	mg/Kg
31	I58	1	1	7/25/2011	Lead	30.9	mg/Kg
32	S58	1	1	7/27/2011	Lead	31.7	mg/Kg
33	Q53	0	1	7/16/2011	Lead	34.9	mg/Kg
34	R52	1	1	7/16/2011	Lead	36.3	mg/Kg
35	J61	1	1	7/25/2011	Lead	39.0	mg/Kg
36	N61	0	1	7/26/2011	Lead	39.1	mg/Kg
37	L62	1	1	7/15/2011	Lead	41.6	mg/Kg
38	M56	1	1	7/25/2011	Lead	42.5	mg/Kg
39	R58	1	1	7/27/2011	Lead	44.1	mg/Kg
40	S48	1	1	7/27/2011	Lead	44.9	mg/Kg
41	T48	1	1	7/27/2011	Lead	46.5	mg/Kg
42	S57	1	1	7/27/2011	Lead	47.5	mg/Kg
43	L64	1	1	7/15/2011	Lead	48.8	mg/Kg
44	K57	1	1	7/25/2011	Lead	51.5	mg/Kg
45	M58	1	1	7/25/2011	Lead	53.0	mg/Kg
46	R60-S	0	1	8/11/2011	Lead	57.2	mg/Kg

Grey = detection limit applied

D1 - top of sample

D2 - bottom of sample

Record	Location	D1 - feet	D2 - feet	Date	Parameter	Result	Units
47	J52	1	1	8/4/2011	Lead	61.9	mg/Kg
48	T49	1	1	7/27/2011	Lead	63.2	mg/Kg
49	Z65	1	1	7/15/2011	Lead	64.9	mg/Kg
50	T56	1	1	7/27/2011	Lead	67.0	mg/Kg
51	T55	1	1	7/27/2011	Lead	70.6	mg/Kg
52	M65	1	1	7/15/2011	Lead	73.4	mg/Kg
53	M57	1	1	7/25/2011	Lead	74.7	mg/Kg
54	B-41	1	1	3/6/2000	Lead	75.0	mg/Kg
55	K50-S	0	1	8/16/2011	Lead	76.6	mg/Kg
56	B-29	1	1	6/13/2000	Lead	77.2	mg/Kg
57	S55	1	1	7/27/2011	Lead	82.5	mg/Kg
58	K65	1	1	7/15/2011	Lead	84.9	mg/Kg
59	Q50	0	1	7/27/2011	Lead	85.1	mg/Kg
60	B-44	1	1	6/13/2000	Lead	85.8	mg/Kg
61	S50	1	1	7/27/2011	Lead	86.2	mg/Kg
62	L51-S	0	1	7/26/2011	Lead	88.2	mg/Kg
63	H51-S	0	1	8/16/2011	Lead	88.3	mg/Kg
64	K56	1	1	7/25/2011	Lead	88.8	mg/Kg
65	J49	1	1	8/16/2011	Lead	95.4	mg/Kg
66	L63	1	1	7/15/2011	Lead	96.4	mg/Kg
67	R50	1	1	7/27/2011	Lead	96.5	mg/Kg
68	T50	1	1	7/27/2011	Lead	98.8	mg/Kg
69	S59	1	1	7/27/2011	Lead	101.0	mg/Kg
70	L54	1	1	7/26/2011	Lead	104.0	mg/Kg
71	K42-SE	0	1	7/27/2011	Lead	106.0	mg/Kg
72	I50-SE	0	1	8/16/2011	Lead	109.0	mg/Kg
73	T59	1	1	7/27/2011	Lead	110.0	mg/Kg
74	K64	1	1	7/15/2011	Lead	112.0	mg/Kg
75	S56	1	1	7/27/2011	Lead	112.0	mg/Kg
76	I51-SN	0	1	8/16/2011	Lead	120.0	mg/Kg
77	L57	1	1	7/25/2011	Lead	124.0	mg/Kg
78	H41	1	1	7/27/2011	Lead	125.0	mg/Kg
79	R56	1	1	7/27/2011	Lead	129.0	mg/Kg
80	G41	0	1	7/27/2011	Lead	129.0	mg/Kg
81	M55	1	1	7/26/2011	Lead	134.0	mg/Kg
82	R49	1	1	7/27/2011	Lead	137.0	mg/Kg
83	K39-S	0	1	8/9/2011	Lead	141.0	mg/Kg
84	O27-S	0	1	8/16/2011	Lead	144.0	mg/Kg
85	b-42a-74	0	0.5	3/11/2009	Lead, field	144.9	mg/Kg
86	R60	1	1	8/11/2011	Lead	151.0	mg/Kg
87	O44	1	1	7/27/2011	Lead	152.0	mg/Kg
88	R51	1	1	7/16/2011	Lead	153.0	mg/Kg
89	S54	1	1	7/16/2011	Lead	153.0	mg/Kg
90	J39	0	1	7/27/2011	Lead	157.0	mg/Kg
91	K59	1	1	7/15/2011	Lead	159.0	mg/Kg
92	L53	1	1	7/26/2011	Lead	160.0	mg/Kg

Grey = detection limit applied

D1 - top of sample

D2 - bottom of sample

Record	Location	D1 - feet	D2 - feet	Date	Parameter	Result	Units
93	N56	0	1	7/26/2011	Lead	162.0	mg/Kg
94	K63	1	1	7/15/2011	Lead	163.0	mg/Kg
95	B-42-SE	0	0	10/3/2002	Lead	166.0	mg/Kg
96	Y65	1	1	7/15/2011	Lead	184.0	mg/Kg
97	I53	1	1	8/4/2011	Lead	186.0	mg/Kg
98	I59	1	1	7/25/2011	Lead	189.0	mg/Kg
99	J58	1	1	7/25/2011	Lead	200.0	mg/Kg
100	I62	1	1	7/25/2011	Lead	201.0	mg/Kg
101	K55	1	1	7/26/2011	Lead	208.0	mg/Kg
102	K43-SE	0	1	8/9/2011	Lead	208.0	mg/Kg
103	H40	0	1	7/14/2011	Lead	210.0	mg/Kg
104	J49-S	0	1	8/16/2011	Lead	222.0	mg/Kg
105	M62	1	1	7/15/2011	Lead	224.0	mg/Kg
106	W65	1	1	7/15/2011	Lead	226.0	mg/Kg
107	Q58-S	0	1	8/4/2011	Lead	240.0	mg/Kg
108	J43-2	1	1	8/9/2011	Lead	241.0	mg/Kg
109	B-53	1	1	6/22/2000	Lead	252.4	mg/Kg
110	S65	1	1	7/15/2011	Lead	254.0	mg/Kg
111	ff41-S	0	1	7/16/2011	Lead	261.0	mg/Kg
112	b-42a-76	0	0.5	3/11/2009	Lead, field	266.4	mg/Kg
113	K53	1	1	7/26/2011	Lead	268.0	mg/Kg
114	I63-S	0	1	7/26/2011	Lead	276.0	mg/Kg
115	I61	1	1	7/25/2011	Lead	291.0	mg/Kg
116	AA65	1	1	7/15/2011	Lead	294.0	mg/Kg
117	Q54	0	1	7/27/2011	Lead	299.0	mg/Kg
118	X65	1	1	7/15/2011	Lead	304.0	mg/Kg
119	H53-S	0	1	8/4/2011	Lead	304.0	mg/Kg
120	b-42a-71	0	0.5	3/11/2009	Lead	309.0	mg/Kg
121	T47	1	1	7/27/2011	Lead	311.0	mg/Kg
122	b-63-5	0	1	3/30/2009	Lead, field	314.2	mg/Kg
123	R55	1	1	7/27/2011	Lead	318.0	mg/Kg
124	JJ41	0	1	7/18/2011	Lead	319.0	mg/Kg
125	b-63-ssw4	0	0	11/8/2002	Lead	320.0	mg/Kg
126	R57	1	1	7/27/2011	Lead	325.0	mg/Kg
127	b-42a-71	0	0.5	3/11/2009	Lead, field	327.0	mg/Kg
128	V65	1	1	7/15/2011	Lead	334.0	mg/Kg
129	HA-04	0	0	3/6/2000	Lead	340.0	mg/Kg
130	BB65	1	1	7/15/2011	Lead	345.0	mg/Kg
131	GG41	1	1	7/16/2011	Lead	348.0	mg/Kg
132	N52-S	0	1	8/4/2011	Lead	386.0	mg/Kg
133	Q49	0	1	7/27/2011	Lead	400.0	mg/Kg
134	b-42a-13	0	0.5	3/11/2009	Lead, field	403.4	mg/Kg
135	FF41	1	1	7/16/2011	Lead	409.0	mg/Kg
136	Q60-S	0	1	8/11/2011	Lead	410.0	mg/Kg
137	b-42a-51	0	0.5	3/11/2009	Lead, field	414.7	mg/Kg
138	R47	1	1	7/27/2011	Lead	415.0	mg/Kg

Grey = detection limit applied

D1 - top of sample

D2 - bottom of sample

Record	Location	D1 - feet	D2 - feet	Date	Parameter	Result	Units
139	b-42a-73	0	0.5	3/11/2009	Lead	420.0	mg/Kg
140	K51	1	1	7/26/2011	Lead	432.0	mg/Kg
141	b-42a-14	0	0.5	3/11/2009	Lead, field	434.9	mg/Kg
142	GG40	1	1	7/16/2011	Lead	435.0	mg/Kg
143	b-42a-117	0	1	3/30/2009	Lead, field	447.2	mg/Kg
144	b-42a-82	0	0.5	3/11/2009	Lead, field	452.3	mg/Kg
145	b-42a-83	0	0.5	3/11/2009	Lead, field	457.7	mg/Kg
146	b-42a-40	0	0.5	3/11/2009	Lead, field	459.6	mg/Kg
147	b-42a-29	0	0.5	3/11/2009	Lead, field	487.4	mg/Kg
148	b-42a-58	0	0.5	3/11/2009	Lead, field	497.0	mg/Kg
149	Q55	0	1	7/27/2011	Lead	498.0	mg/Kg
150	J44-S	0	1	8/9/2011	Lead	505.0	mg/Kg
151	Q51	0	1	7/16/2011	Lead	508.0	mg/Kg
152	b-42a-43	0	0.5	3/11/2009	Lead, field	511.5	mg/Kg
153	J63	1	1	7/25/2011	Lead	515.0	mg/Kg
154	S59-S	0	1	7/27/2011	Lead	516.0	mg/Kg
155	b-42a-56	0	0.5	3/11/2009	Lead, field	519.2	mg/Kg
156	L59	1	1	7/15/2011	Lead	520.0	mg/Kg
157	M59	1	1	7/15/2011	Lead	520.0	mg/Kg
158	B-63-SSE5	0	0	1/16/2003	Lead	524.0	mg/Kg
159	B-63-SSW5	0	0	1/16/2003	Lead	539.0	mg/Kg
160	Q57-SN	0	1	8/4/2011	Lead	539.0	mg/Kg
161	b-42a-28	0	0.5	3/11/2009	Lead, field	539.2	mg/Kg
162	b-42a-121	0	1	3/30/2009	Lead, field	543.7	mg/Kg
163	L65	1	1	7/15/2011	Lead	550.0	mg/Kg
164	b-42a-77	0	0.5	3/11/2009	Lead, field	550.5	mg/Kg
165	B-42-SW	0	0	10/3/2002	Lead	552.0	mg/Kg
166	I63	1	1	7/25/2011	Lead	553.0	mg/Kg
167	B-31a-1	0	0.5	2/24/2009	Lead	563.0	mg/Kg
168	b-42a-118	0	1	3/30/2009	Lead, field	567.5	mg/Kg
169	GG42	0	1	7/16/2011	Lead	573.0	mg/Kg
170	b-42a-18	0	0.5	3/11/2009	Lead, field	574.6	mg/Kg
171	Q47	0	1	7/27/2011	Lead	575.0	mg/Kg
172	SD-01	1	1	6/22/2000	Lead	577.1	mg/Kg
173	U65	1	1	7/15/2011	Lead	586.0	mg/Kg
174	I62-S	0	1	7/26/2011	Lead	589.0	mg/Kg
175	I39	0	1	7/27/2011	Lead	594.0	mg/Kg
176	N54	0	1	7/26/2011	Lead	606.0	mg/Kg
177	L58	1	1	7/25/2011	Lead	609.0	mg/Kg
178	b-63-6	0	1	3/30/2009	Lead, field	610.6	mg/Kg
179	T65	1	1	7/15/2011	Lead	618.0	mg/Kg
180	b-42a-72	0	0.5	3/11/2009	Lead, field	624.1	mg/Kg
181	K52	1	1	7/26/2011	Lead	626.0	mg/Kg
182	b-42a-46	0	0.5	3/11/2009	Lead, field	629.7	mg/Kg
183	O44-S	0	1	7/27/2011	Lead	638.0	mg/Kg
184	KK40	1	1	7/18/2011	Lead	644.0	mg/Kg

Grey = detection limit applied

D1 - top of sample

D2 - bottom of sample

Record	Location	D1 - feet	D2 - feet	Date	Parameter	Result	Units
185	J43-SW	0	1	8/9/2011	Lead	644.0	mg/Kg
186	b-42a-75	0	0.5	3/11/2009	Lead	650.0	mg/Kg
187	I57-S	0	1	7/26/2011	Lead	653.0	mg/Kg
188	b-42a-29	0	0.5	3/11/2009	Lead	655.0	mg/Kg
189	I57	1	1	7/25/2011	Lead	656.0	mg/Kg
190	b-42a-75	0	0.5	3/11/2009	Lead, field	656.7	mg/Kg
191	B-42-NW	0	0	10/3/2002	Lead	658.0	mg/Kg
192	N46	1	1	7/27/2011	Lead	675.0	mg/Kg
193	J62	1	1	7/25/2011	Lead	681.0	mg/Kg
194	b-42a-120	0	1	3/30/2009	Lead, field	694.8	mg/Kg
195	b-42a-69	0	0.5	3/11/2009	Lead, field	698.0	mg/Kg
196	b-42a-89	0	0.5	3/11/2009	Lead, field	717.0	mg/Kg
197	BB66	0	1	7/15/2011	Lead	719.0	mg/Kg
198	b-42a-89	0	1	3/30/2009	Lead, field	720.3	mg/Kg
199	b-63-sw2	0	0	10/1/2002	Lead	728.0	mg/Kg
200	N44-S	0	1	7/27/2011	Lead	733.0	mg/Kg
201	K61	1	1	7/15/2011	Lead	737.0	mg/Kg
202	b-42a-39	0	0.5	3/11/2009	Lead, field	744.5	mg/Kg
203	H64-S	0	1	7/26/2011	Lead	771.0	mg/Kg
204	J50	1	1	8/11/2011	Lead	775.0	mg/Kg
205	T46	1	1	7/27/2011	Lead	779.0	mg/Kg
206	b-42a-24	0	0.5	3/11/2009	Lead, field	781.1	mg/Kg
207	N44	1	1	7/27/2011	Lead	783.0	mg/Kg
208	P55-S2	0	1	8/11/2011	Lead	797.0	mg/Kg
209	b-42a-35	0	0.5	3/11/2009	Lead, field	799.0	mg/Kg
210	FF40	1	1	7/16/2011	Lead	805.0	mg/Kg
211	I56	0	1	7/26/2011	Lead	807.0	mg/Kg
212	I64	1	1	7/25/2011	Lead	808.0	mg/Kg
213	P57-S	0	1	8/11/2011	Lead	813.0	mg/Kg
214	I52-SE	0	1	8/4/2011	Lead	819.0	mg/Kg
215	N58	0	1	8/3/2011	Lead	834.0	mg/Kg
216	L40-S	0	1	8/9/2011	Lead	851.0	mg/Kg
217	I59-S	0	1	7/26/2011	Lead	855.0	mg/Kg
218	O46-S	0	1	7/27/2011	Lead	855.0	mg/Kg
219	O53-S	0	1	8/4/2011	Lead	862.0	mg/Kg
220	O56-S	0	1	8/11/2011	Lead	873.0	mg/Kg
221	I54-S	0	1	8/4/2011	Lead	876.0	mg/Kg
222	K42-SN	0	1	7/27/2011	Lead	881.0	mg/Kg
223	b-42a-48	0	0.5	3/11/2009	Lead, field	888.0	mg/Kg
224	O46	1	1	7/27/2011	Lead	906.0	mg/Kg
225	P59-S	0	1	8/4/2011	Lead	908.0	mg/Kg
226	H42	0	1	7/14/2011	Lead	918.0	mg/Kg
227	M54	1	1	7/26/2011	Lead	921.0	mg/Kg
228	I54	0	1	7/26/2011	Lead	929.0	mg/Kg
229	MM42	1	1	7/18/2011	Lead	941.0	mg/Kg
230	J55	1	1	7/26/2011	Lead	953.0	mg/Kg

Grey = detection limit applied

D1 - top of sample

D2 - bottom of sample

Record	Location	D1 - feet	D2 - feet	Date	Parameter	Result	Units
231	B-31a-2	0	0.5	2/24/2009	Lead	966.0	mg/Kg
232	b-42a-49	0	0.5	3/11/2009	Lead, field	966.1	mg/Kg
233	M52	0	1	7/26/2011	Lead	983.0	mg/Kg
234	b-63-sw	0	0	10/1/2002	Lead	986.0	mg/Kg
235	b-42a-57	0	0.5	3/11/2009	Lead, field	989.7	mg/Kg
236	N46-S	0	1	7/27/2011	Lead	998.0	mg/Kg
237	LL43	0	1	7/18/2011	Lead	999.0	mg/Kg
238	b-42a-47	0	0.5	3/11/2009	Lead, field	1,001.1	mg/Kg
239	b-42a-64	0	0.5	3/11/2009	Lead, field	1,002.2	mg/Kg
240	b-42a-54	0	0.5	3/11/2009	Lead, field	1,003.6	mg/Kg
241	R46	1	1	7/27/2011	Lead	1,010.0	mg/Kg
242	b-42a-63	0	0.5	3/11/2009	Lead, field	1,016.4	mg/Kg
243	LL42	1	1	7/18/2011	Lead	1,020.0	mg/Kg
244	B-42-NE	0	0	10/3/2002	Lead	1,020.0	mg/Kg
245	b-42a-61	0	0.5	3/11/2009	Lead, field	1,027.9	mg/Kg
246	b-42a-62	0	0.5	3/11/2009	Lead, field	1,054.9	mg/Kg
247	Q57	0	1	7/27/2011	Lead	1,060.0	mg/Kg
248	I60-S	0	1	7/26/2011	Lead	1,090.0	mg/Kg
249	G65	0	1	7/26/2011	Lead	1,100.0	mg/Kg
250	J53	1	1	7/26/2011	Lead	1,120.0	mg/Kg
251	Q46	0	1	7/27/2011	Lead	1,120.0	mg/Kg
252	N45	1	1	7/27/2011	Lead	1,130.0	mg/Kg
253	N63	0	1	7/26/2011	Lead	1,130.0	mg/Kg
254	Q55-S	0	1	8/4/2011	Lead	1,130.0	mg/Kg
255	H65	1	1	7/25/2011	Lead	1,170.0	mg/Kg
256	I60	1	1	7/25/2011	Lead	1,170.0	mg/Kg
257	B-31a-3	0	0.5	2/24/2009	Lead	1,170.0	mg/Kg
258	K60	1	1	7/15/2011	Lead	1,180.0	mg/Kg
259	KK43	0	1	7/18/2011	Lead	1,200.0	mg/Kg
260	J65	1	1	7/25/2011	Lead	1,220.0	mg/Kg
261	b-42a-86	0	0.5	3/11/2009	Lead, field	1,227.7	mg/Kg
262	R48	1	1	7/27/2011	Lead	1,230.0	mg/Kg
263	b-42a-55	0	0.5	3/11/2009	Lead, field	1,232.3	mg/Kg
264	b-42a-50	0	0.5	3/11/2009	Lead, field	1,241.9	mg/Kg
265	b-42a-119	0	1	3/30/2009	Lead, field	1,242.4	mg/Kg
266	O59	0	1	8/3/2011	Lead	1,250.0	mg/Kg
267	b-42a-59	0	0.5	3/11/2009	Lead, field	1,267.6	mg/Kg
268	L41	0	1	7/27/2011	Lead	1,280.0	mg/Kg
269	b-31a	0	0.5	2/24/2009	Lead	1,290.0	mg/Kg
270	I43	0	1	7/27/2011	Lead	1,290.0	mg/Kg

Grey = detection limit applied
D1 - top of sample
D2 - bottom of sample

Section 4 Soil Lead Data Summary - ProUCL Input

Record	Location	D1 - feet	D2 - feet	Date	Parameter	Result	Units
1	B-2-NE	0	0	10/2/2002	Lead	1.5	mg/Kg
2	B-2-NW	0	0	10/2/2002	Lead	1.5	mg/Kg
3	B-2-SE	0	0	10/2/2002	Lead	1.5	mg/Kg
4	B-2-SW	0	0	10/2/2002	Lead	1.5	mg/Kg
5	B-2	0	0	10/2/2002	Lead	0.8	mg/Kg
6	L66	1	1	7/15/2011	Lead	5.5	mg/Kg
7	M67	1	1	7/15/2011	Lead	9.1	mg/Kg
8	J67	1	1	7/25/2011	Lead	9.6	mg/Kg
9	TW-06	1	1	6/12/2000	Lead	15.0	mg/Kg
10	B-03	1	1	2/23/2000	Lead	16.0	mg/Kg
11	I67	1	1	7/25/2011	Lead	17.6	mg/Kg
12	L67	1	1	7/15/2011	Lead	17.7	mg/Kg
13	O67-S	0	1	8/31/2011	Lead	18.0	mg/Kg
14	N66-2	1	1	8/3/2011	Lead	20.9	mg/Kg
15	Y67	1	1	8/1/2011	Lead	21.7	mg/Kg
16	Z67	1	1	8/1/2011	Lead	22.5	mg/Kg
17	J69	1	1	7/25/2011	Lead	24.0	mg/Kg
18	O66-2	1	1	8/31/2011	Lead	25.3	mg/Kg
19	L68	1	1	7/15/2011	Lead	28.9	mg/Kg
20	K68	1	1	7/15/2011	Lead	29.9	mg/Kg
21	M68	1	1	7/15/2011	Lead	30.1	mg/Kg
22	H68	1	1	7/25/2011	Lead	35.6	mg/Kg
23	I68	1	1	7/25/2011	Lead	37.5	mg/Kg
24	X67	1	1	8/1/2011	Lead	37.5	mg/Kg
25	L70	1	1	7/25/2011	Lead	38.5	mg/Kg
26	P66-S	0	1	8/31/2011	Lead	43.0	mg/Kg
27	TW-05	1	1	6/12/2000	Lead	44.3	mg/Kg
28	B-34	1	1	2/24/2000	Lead	51.0	mg/Kg
29	O65-S	0	1	8/31/2011	Lead	56.5	mg/Kg
30	M66	1	1	7/15/2011	Lead	59.2	mg/Kg
31	L69	1	1	7/25/2011	Lead	59.5	mg/Kg
32	M65	1	1	7/15/2011	Lead	73.4	mg/Kg
33	B-41	1	1	3/6/2000	Lead	75.0	mg/Kg
34	B-54	1	1	6/22/2000	Lead	81.6	mg/Kg
35	K65	1	1	7/15/2011	Lead	84.9	mg/Kg
36	I69	1	1	7/25/2011	Lead	92.1	mg/Kg
37	B-36	1	1	2/24/2000	Lead	95.0	mg/Kg
38	B-94	1	1	9/20/2000	Lead	95.2	mg/Kg
39	J68	1	1	7/25/2011	Lead	109.0	mg/Kg
40	L71	1	1	7/25/2011	Lead	114.0	mg/Kg
41	B-33	1	1	2/25/2000	Lead	140.0	mg/Kg
42	B-95	1	1	9/20/2000	Lead	160.4	mg/Kg
43	J66	1	1	7/25/2011	Lead	188.0	mg/Kg
44	B-02	1	1	2/24/2000	Lead	200.0	mg/Kg
45	S66	0	1	7/15/2011	Lead	202.0	mg/Kg
46	B-01	1	1	2/23/2000	Lead	210.0	mg/Kg

Grey = detection limit applied

D1 - top of sample

D2 - bottom of sample

Record	Location	D1 - feet	D2 - feet	Date	Parameter	Result	Units
47	B-57	1	1	6/22/2000	Lead	220.7	mg/Kg
48	M69	1	1	7/25/2011	Lead	222.0	mg/Kg
49	AA66	1	1	7/15/2011	Lead	229.0	mg/Kg
50	M70	1	1	7/25/2011	Lead	229.0	mg/Kg
51	B-58	1	1	6/23/2000	Lead	245.2	mg/Kg
52	X66	0	1	7/15/2011	Lead	248.0	mg/Kg
53	H68-S	0	1	7/26/2011	Lead	249.0	mg/Kg
54	S65	1	1	7/15/2011	Lead	254.0	mg/Kg
55	aa66-S	0	1	7/15/2011	Lead	254.0	mg/Kg
56	K66	1	1	7/15/2011	Lead	279.0	mg/Kg
57	B-32	1	1	2/24/2000	Lead	280.0	mg/Kg
58	Z67-S	0	1	7/22/2011	Lead	301.0	mg/Kg
59	b-42a-108	0	1	3/30/2009	Lead, field	312.1	mg/Kg
60	B-30	1	1	3/6/2000	Lead	320.0	mg/Kg
61	b-42a-107	0	1	3/30/2009	Lead, field	326.8	mg/Kg
62	K69	1	1	7/25/2011	Lead	330.0	mg/Kg
63	N68	0	1	7/26/2011	Lead	330.0	mg/Kg
64	W67	1	1	8/1/2011	Lead	340.0	mg/Kg
65	B-04	1	1	2/24/2000	Lead	350.0	mg/Kg
66	b-42a-113	0	1	3/30/2009	Lead, field	357.9	mg/Kg
67	N67	0	1	7/26/2011	Lead	369.0	mg/Kg
68	b-42a-102	0	1	3/30/2009	Lead, field	383.7	mg/Kg
69	MW-01	1	1	2/25/2000	Lead	410.0	mg/Kg
70	B-35	1	1	2/24/2000	Lead	420.0	mg/Kg
71	V66-SW	0	1	8/9/2011	Lead	433.0	mg/Kg
72	b-42a-117	0	1	3/30/2009	Lead, field	447.2	mg/Kg
73	b-42a-103	0	1	3/30/2009	Lead, field	476.3	mg/Kg
74	b-42a-108	0	1	3/30/2009	Lead	484.0	mg/Kg
75	b-42a-116	0	1	3/30/2009	Lead	508.0	mg/Kg
76	V67-S	0	1	7/22/2011	Lead	511.0	mg/Kg
77	K67	1	1	7/15/2011	Lead	523.0	mg/Kg
78	b-42a-112	0	1	3/30/2009	Lead, field	526.5	mg/Kg
79	L65	1	1	7/15/2011	Lead	550.0	mg/Kg
80	I69-S	0	1	7/26/2011	Lead	556.0	mg/Kg
81	b-42a-30	0	0.5	3/11/2009	Lead, field	557.2	mg/Kg
82	b-42a-105	0	1	3/30/2009	Lead, field	559.8	mg/Kg
83	X67-S	0	1	7/22/2011	Lead	560.0	mg/Kg
84	J70	0	1	7/26/2011	Lead	566.0	mg/Kg
85	U65	1	1	7/15/2011	Lead	586.0	mg/Kg
86	T65	1	1	7/15/2011	Lead	618.0	mg/Kg
87	b-42a-101	0	1	3/30/2009	Lead, field	638.0	mg/Kg
88	U66	0	1	7/15/2011	Lead	657.0	mg/Kg
89	B-31a-5	0	0.5	2/24/2009	Lead	662.0	mg/Kg
90	L71-S	0	1	7/26/2011	Lead	687.0	mg/Kg
91	K70	1	1	7/25/2011	Lead	702.0	mg/Kg
92	G67	0	1	7/26/2011	Lead	703.0	mg/Kg

Grey = detection limit applied

D1 - top of sample

D2 - bottom of sample

Record	Location	D1 - feet	D2 - feet	Date	Parameter	Result	Units
93	BB66	0	1	7/15/2011	Lead	719.0	mg/Kg
94	H67	1	1	7/25/2011	Lead	740.0	mg/Kg
95	b-42a-116	0	1	3/30/2009	Lead, field	741.0	mg/Kg
96	I66	1	1	7/25/2011	Lead	745.0	mg/Kg
97	b-42a-106	0	1	3/30/2009	Lead, field	800.7	mg/Kg
98	K71	0	1	7/26/2011	Lead	820.0	mg/Kg
99	b-42a-104	0	1	3/30/2009	Lead, field	826.3	mg/Kg
100	b-42a-111	0	1	3/30/2009	Lead, field	877.6	mg/Kg
101	H66	1	1	7/25/2011	Lead	896.0	mg/Kg
102	B-31a-7	0	0.5	2/24/2009	Lead	905.0	mg/Kg
103	B-31a-6	0	0.5	2/24/2009	Lead	984.0	mg/Kg
104	G65	0	1	7/26/2011	Lead	1,100.0	mg/Kg
105	N67-SN	0	1	8/3/2011	Lead	1,130.0	mg/Kg
106	H65	1	1	7/25/2011	Lead	1,170.0	mg/Kg
107	J65	1	1	7/25/2011	Lead	1,220.0	mg/Kg
108	b-42a-110	0	1	3/30/2009	Lead, field	1,298.9	mg/Kg

Grey = detection limit applied
D1 - top of sample
D2 - bottom of sample

APPENDIX K
Groundwater Model Input and Output

BIOCHLOR Natural Attenuation Decision Support System

Former Transco Rail Yard

Run Name

Data Input Instructions:

115 → 1. Enter value directly....or

↑ or

0.02 → 2. Calculate by filling in gray cells. Press Enter, then (C)

(To restore formulas, hit "Restore Formulas" button)

Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

1. ADVECTION

Seepage Velocity*	Vs	124.2	(ft/yr)
or			
Hydraulic Conductivity	K	1.0E-03	(cm/sec)
Hydraulic Gradient	i	0.024	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	15	(ft)
(Alpha y) / (Alpha x)*	0.1	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R

or

	Koc		R	
Soil Bulk Density, rho	1.7	(kg/L)		
FractionOrganicCarbon, foc	1.5E-3	(-)		
Partition Coefficient				
PCE	426	(L/kg)	6.43	(-)
TCE	130	(L/kg)	2.66	(-)
DCE	125	(L/kg)	2.59	(-)
VC	30	(L/kg)	1.38	(-)
ETH	302	(L/kg)	4.85	(-)

Common R (used in model)* = 2.66

4. BIOTRANSFORMATION

-1st Order Decay Coefficient*

	λ (1/yr)	half-life (yrs)	Yield
Zone 1			
PCE → TCE	0.800		0.79
TCE → DCE	0.780		0.74
DCE → VC	2.500		0.64
VC → ETH	3.000		0.45
Zone 2	λ (1/yr)	half-life (yrs)	
PCE → TCE	0.000		
TCE → DCE	0.000		
DCE → VC	0.000		
VC → ETH	0.000		

λ HELP

5. GENERAL

Simulation Time*	33	(yr)
Modeled Area Width*	500	(ft)
Modeled Area Length*	1500	(ft)
Zone 1 Length*	1500	(ft)
Zone 2 Length*	0	(ft)

L, W

Zone 2= L - Zone 1

6. SOURCE DATA

TYPE: Continuous Single Planar

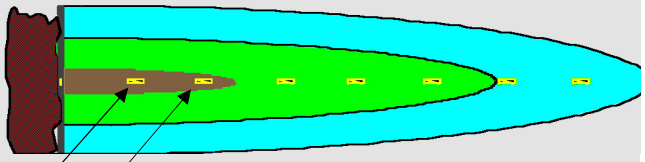
Source Options

Source Thickness in Sat. Zone* 30 (ft)

Width* (ft) Y1: 150

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE	.02	0
TCE	.16	0
DCE	.042	0
VC	.0	0
ETH	0	0

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

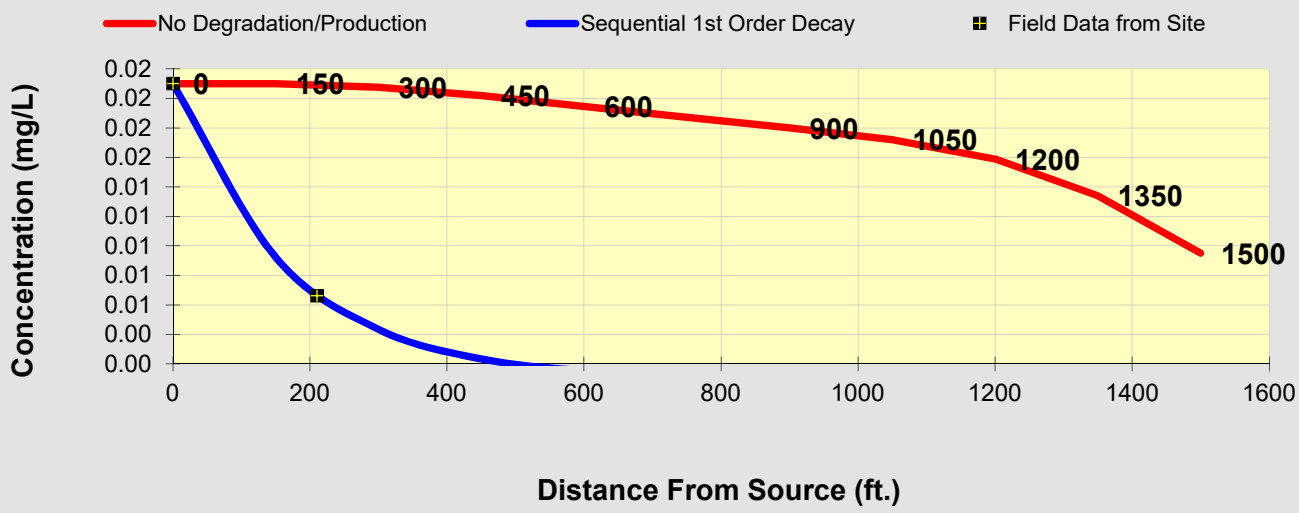
PCE Conc. (mg/L)	.02	.006	.0								
TCE Conc. (mg/L)	.16	.049	.0								
DCE Conc. (mg/L)	.042	.016	.0								
VC Conc. (mg/L)	0.0	.007	.0								
ETH Conc. (mg/L)	0.0	.0	.0								
Distance from Source (ft)	0	210	510								
Date Data Collected	2016										

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | RUN ARRAY | Help | Restore | RESET | SEE OUTPUT | Paste

DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

PCE	Distance from Source (ft)										
	0	150	300	450	600	750	900	1050	1200	1350	1500
No Degradation	0.020	0.020	0.020	0.019	0.018	0.018	0.017	0.016	0.015	0.012	0.008
Biotransformation	0.0200	0.008	0.003	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000
	Monitoring Well Locations (ft)										
	0	210	510								
Field Data from Site	0.020	0.006	0.000								



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

33.0 Years

Log ⟺ Linear

Return to Input

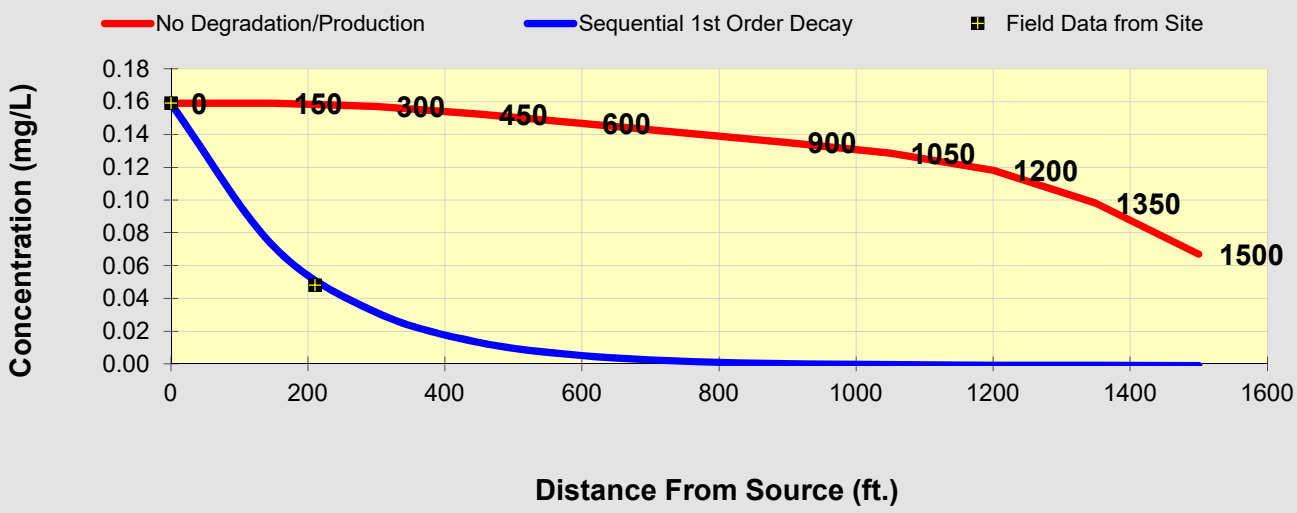
To All

To Array

DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

TCE	Distance from Source (ft)										
	0	150	300	450	600	750	900	1050	1200	1350	1500
No Degradation	0.160	0.160	0.158	0.153	0.148	0.142	0.136	0.130	0.119	0.099	0.068
Biotransformation	0.1600	0.073	0.032	0.014	0.006	0.003	0.001	0.000	0.000	0.000	0.000

	Monitoring Well Locations (ft)										
	0	210	510								
Field Data from Site	0.160	0.049	0.000								



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

33.0 Years

Log ⟺ Linear

Return to Input

To All

To Array

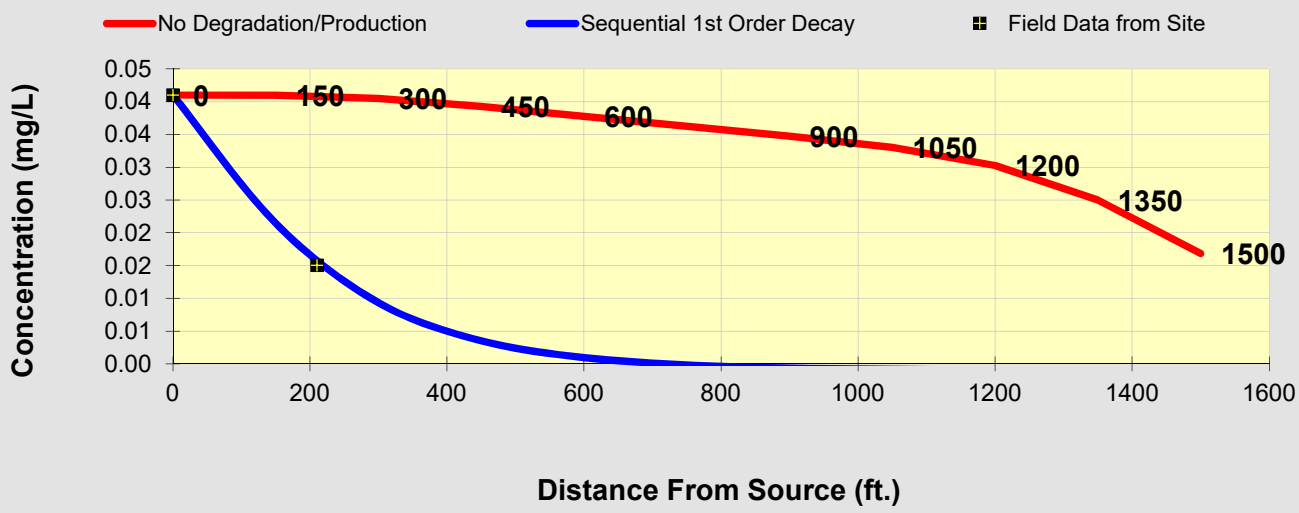
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

DCE	0	150	300	450	600	750	900	1050	1200	1350	1500
No Degradation	0.042	0.042	0.041	0.040	0.039	0.037	0.036	0.034	0.031	0.026	0.018
Biotransformation	0.0420	0.022	0.010	0.005	0.002	0.001	0.000	0.000	0.000	0.000	0.000

Monitoring Well Locations (ft)

	0	210	510								
Field Data from Site	0.042	0.016	0.000								



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

33.0 Years

Log ⟺ Linear

Return to Input

To All

To Array

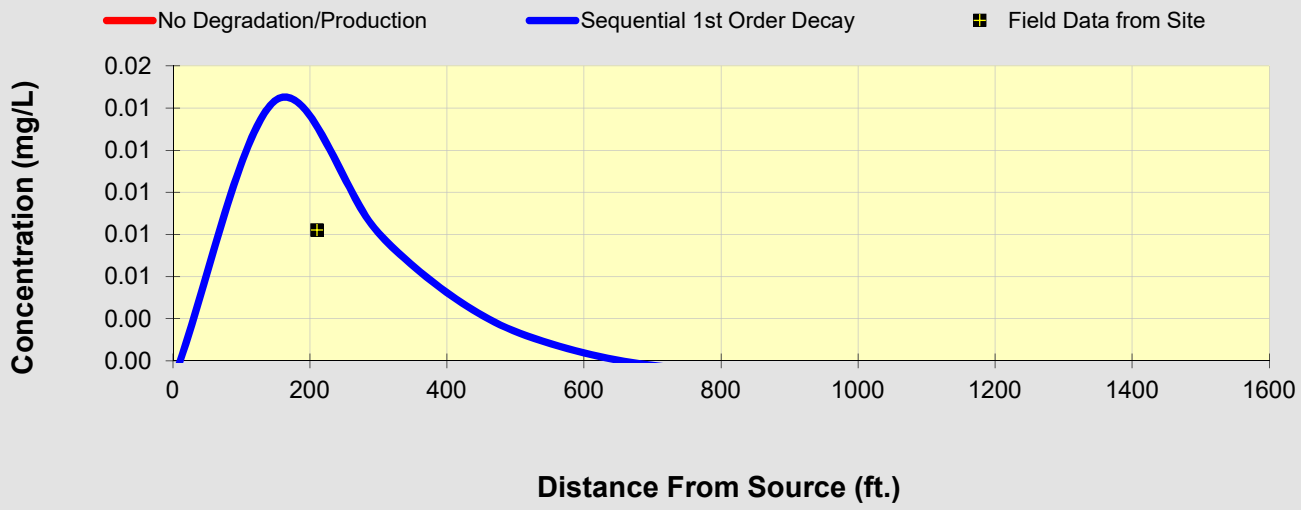
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

VC	0	150	300	450	600	750	900	1050	1200	1350	1500
No Degradation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Biotransformation	0.0000	0.013	0.007	0.003	0.001	0.001	0.000	0.000	0.000	0.000	0.000

Monitoring Well Locations (ft)

	0	210	510								
Field Data from Site	0.000	0.007	0.000								



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

33.0 Years

Log ⟺ Linear

Return to Input

To All

To Array